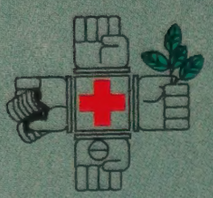
A Report on Nutritional Crisis in Maharashtra



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SATHI

for

Maharashtra Health Equity & Rights Watch

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Nutritional Crisis in Maharashtra

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Preface

We often hear the somewhat clichéd statement that "Maharashtra is a developed state". One response to this 'modern myth' may be an assertion that there are different sections among the population, who have vastly differing levels of consumption and well-being, hence claiming that all people in Maharashtra enjoy the fruits of 'development' is far from accurate. Another response could be to question the entire current model of 'development', which does create certain kind of wealth but perpetuates massive disparities, and promotes certain patterns of consumption and living which are not healthy for either the rich or the poor.

Whatever may be our viewpoint about what kind of development we want, we would all accept that having a healthy and well nourished population is one of the key desired outcomes of any developmental process. Hence one good way to approach the broader debate on Maharashtra's development may be to examine the undisputable objective evidence displayed by the bodies of people – children and adults – in the state. In this 'developed' state, what proportion of children and adults are well nourished? What proportion are undernourished or 'over-nourished'? What kinds of diets are people consuming? Are most people getting better nourished over time as 'development' marches forward? These questions can be answered based on hard facts and figures, which go beyond opinions and hence give us a reasonably objective understanding of the situation. This report makes such an attempt to analyse the status of nutrition of children and adults in Maharashtra, and comes up with certain conclusions which are reflected in the title of the report – 'Nutritional crisis in Maharashtra'.

However, analyzing the state of nutrition is not enough, we have a responsibility of going further and understanding *why* this state of affairs continues to prevail, and what is the status of various programmes and schemes designed to improve food security and nutrition. Without such an understanding, we will not be able to point out the changes in developmental approach, policies, strategies and programmes that must be made to achieve significantly better nutritional outcomes for the entire population. This report also attempts to make such an analysis, with the understanding that nutritional status is a final outcome of multiple level processes which include – socioeconomic status and livelihood, food security measures, nutritional supplementation programmes, and delivery of appropriate health care.

It is hoped that this report with various dimensions of analysis will be a small contribution to ongoing debates about nutrition and food security, in the context of the larger developmental framework. It is hoped that the report would throw some light on where we stand and how we can achieve one of the most fundamental human needs – the adequate intake of nutritious food - which must be enjoyed as a basic right by all.

Acknowledgements

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We are thankful to Dr. Vandana Prasad, Dr. Yogesh Jain, Dr. Veena Shatrughna, Dr. Madhura Swaminathan and Dr. Neeraj Hatekar for critically reviewing the papers.

Ms. Kerry Scott has substantially contributed in editing of the report and we are grateful for her contributions to this report.

We would like to thank the Administrative staff in SATHI for their full co-operation in overall implementation of the project and special thanks to Ms. Deepali Yakkundi and Ms. Sharada Mahalle of SATHI for formatting the copy for the press.

Last but not the least, we express our gratitude towards International Development Research Centre (IDRC), Canada for the financial assistance.

We look forward to suggestions from readers for furthering this work.

Dr. Abhay Shukla,
Co-ordinator,
SATHI
September, 2009

List of Abbreviations

AAA	-	Anna Adhikar Abhiyan
AAY	-	Antyodaya Anna Yojana
ACDPO	-	Assistant Child Development Programme Officer
AF	-	Anthropometric Failure
AIE	-	Alternative and Innovative Education
ANC	-	Ante Natal Care
APL	-	Above Poverty Line
AWW	-	Anganwadi Worker
BAIF	-	Bharatiya Agro Industries Foundation
BMI	-	Body Mass Index
BPL	-	Below Poverty Line
CBHI	-	Central Bureau of Health Intelligence
CBO	-	Community Based Organisation
CDPO	-	Child Development Programme Officer
CI	-	Confidence interval
DALY	-	Disability Adjusted Life Years
DPAP	-	Drought Prone Area Programme
EGS	-	Employment Guarantee Scheme
FCI	-	Food Corporation of India
FPS	-	Fair Price Shop
GDI	-	Gender Development Index
GDP	-	Gross Domestic Product
GR	-	Government Resolution
GSDP	-	Gross State Domestic Product
HCR	-	Head Count Ratio
HDI	-	Human Development Index
HIV	-	Human Immunodeficiency Virus
ICDS	-	Integrated Child Development Scheme
ICT	-	Information and Communication Technology
IMNCI	-	Integrated Management of Neonatal and Childhood Illness
IMR	-	Infant Mortality Rate
IRDP	-	Integrated Rural Development Programme
ITDP	-	Integrated Tribal Development Projects
LBW	-	Low Birth Weight
KSY	-	Kishori Shakti Yojana
MDM	-	Mid Day Meal
MEGS	-	Maharashtra Employment Guarantee Scheme
MDGs	-	Millennium Development Goals
MME	-	Management, Monitoring and Evaluation
MPCE	-	Monthly Per capita Consumer Expenditure

NCEUS	-	National Commission for Enterprises in Unorganised Sector
NCHS	-	National Centre for Health Statistics
NFHS	-	National Family Health Survey
NGO	-	Non Governmental Organisation
NNMB	-	National Nutrition Monitoring Bureau
NPNL	-	Non Pregnant Non Lactating
NRC	-	Nutrition Rehabilitation Centres
NREGA	-	National Rural Employment Guarantee Act
NSDP	-	Net State Domestic Product
NSS	-	National Sample Survey
NSSO	-	National Sample Survey Organisation
OBC	-	Other Backward Castes
PDS	-	Public Distribution System
PCPNDT	-	Pre conception and Pre Natal Diagnostic Technique
PEM	-	Protein Energy Malnutrition
PHCs	-	Primary Health Centres
PIL	-	Public Interest Litigation
PUCL	-	People's Union of Civil Liberties
RCH	-	Reproductive and Child Health
RDA	-	Recommended Dietary Allowance
RDI	-	Recommended Dietary Intake
RPDS	-	Revamped Public Distribution System
RTI	-	Right to Information
SC	-	Scheduled Castes
SD	-	Standard Deviation
SDP	-	State Domestic Product
SGSY	-	Swarnajayanti Gram Swarozgar Yojana
SHG	-	Self Help Group
SLI	-	Standard of Living Index
SMR	-	Suicide Mortality Rate
SNP	-	Supplementary Nutrition Programme
SRS	-	Sample Registration System
ST	-	Scheduled Tribes
TB	-	Tuberculosis
TE	-	Triennium Ending
TPDS	-	Targeted Public Distribution System
UPA	-	United Progressive Alliance
UTs	-	Union Territories
WHO	-	World Health Organisation

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INTRODUCTION

Introduction

Nutrition is one of the key social determinants of health. In the last 20 years, the state of Maharashtra has made significant progress on different health related indicators, for example the Infant Mortality Rate of Maharashtra has come down from 49 per 1000 live births in 1998[1] to 34 per 1000 live births in 2007[2]. The Maternal Mortality Rate has reduced from 149 in 2001-03 to 130 in 2004-06. The National Rural Health Mission is being implemented in the state since 2005, and this programme has brought certain innovative aspects to the health system like IPHS, Community Based Monitoring and like wise.

The state also has significant economic growth. The Per Capita N.S.D.P. almost doubled from 1996-97[3] to 2006 from Rs. 17825 to 37081 in 2006. However, despite this context, improving nutritional status of the population is one aspect where the state has not been able to make much significant progress.

In the 1994 Nutrition Index[4] Maharashtra was ranked among the lowest at 13th out of the 15 states for which the index was calculated. After 14 years, in 2008, Maharashtra is still only 10th out of the 17 states for which the Indian State Hunger Index Rank[5] (2008) was calculated. Maharashtra's 2008 Hunger Index Score is 22.8, which places it in the category of "alarming hunger," on par with an economically less developed state like Orissa.

In the same period of 1994 to 2008, while Maharashtra's nutritional status remained nearly stagnant; its per capita income has increased substantially. Maharashtra has a NSDP twice as high as that of Orissa whereas the difference between hunger indexes for both these states is negligible. Thus, it is very clear that Maharashtra's social development is not corresponding with its economic growth.[6]

Between 1994 and 2008, other states such as Assam and Tamil nadu have made considerable progress by improving their ranks from 14 to 4 and 12 to 6 respectively. The global comparison of the Hunger Index Rank reveals that Maharashtra is behind Rwanda, Cambodia and Burkina Faso, which are low income countries.

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1 http://censusindia.gov.in/Vital_Statistics/SRS_Bulletins/SRS_Bulletins_links/Bulletin_2000_Vol_33_No_1

2 http://censusindia.gov.in/Vital_Statistics/SRS_Bulletins/SRS_Bulletins_links/SRS_Bulletin_October_2008

3 http://indiabudget.nic.in/es2001-02/chapt2002/tab18

4 The Nutrition Index estimated by Wiesmann (2004) uses the variables same as the India State Hunger Index, i.e. child nutrition, child mortality and calorie undernourishment. The Nutrition Index differs in that it uses FAO dietary energy supply data for estimating calorie undernourishment, and it uses prevalence of underweight among children under four years of age, rather than children under five years of age.

5 The India State Hunger Index is computed by averaging the three underlying components of the hunger index – viz., the proportion of underweight children, the under□five mortality rate (expressed as a percentage of live births), and the prevalence of caloric undernutrition in the population

The index ranks states on a 100-point scale, with 0 being the best score (no hunger) and 100 being the worst, though neither of these extremes is achieved in practice. Values less than 4.9 reflect low hunger, values between 5 and 9.9 reflect moderate hunger, values between 10 and 19.9 indicate a serious problem, values between 20 and 29.9 are alarming, and values exceeding 30 are extremely alarming.

6 Menon P., Deolalikar A. and Bhaskar A. (2008) The India State Hunger Index: Comparisons of Hunger Across States. International Food Policy Research Institute (IFPRI) Available from: <http://www.ifpri.org/pubs/cp/ishi08.pdf> [Accessed 16 October 2008]

The objective of this report is to highlight the paradox that the affluent state of Maharashtra is in a critical situation when nutritional indicators are considered. Undernutrition contributes to unacceptably high infant and child mortality as well as morbidity, disabilities of various kinds, reduced growth and development of children and ultimately reduced potential to contribute to economic, social and political spheres of life. Adults are also affected by undernutrition in the form of anaemia, low Body Mass Index (BMI) and micronutrient deficiencies, which results in unfavourable health outcomes and reduced quality of life. It also contributes to unacceptably high maternal mortality and morbidity as well as low birth weight babies. These babies tend to grow into underweight adults—and in the case of women, go on to become underweight pregnant mothers, thus perpetuating the cycle of undernutrition. Undernutrition in any society is a direct consequence of income and food insecurity, poverty and the failure of the government to take steps to ensure access to a chain of determinants of nutrition, namely food security and health care.

About the Project

Since November 2005, SATHI is working on a research project 'Maharashtra Health Equity and Rights Watch', which looks in to health inequities for various groups based on class, caste, gender and geographical location in the state of Maharashtra. CEHAT Mumbai and Tata Institute of Social Sciences (Mumbai) are collaborating with SATHI in this project. The important primary research activities of this project include a household survey in 10 select districts of Maharashtra to study the inequities in access to healthcare, a survey of public health facilities accessed by the residents of studied villages and an exploratory study of health care access for migrant workers.

Along with primary research, analyzing secondary data to bring out the various dimensions of health inequities is also an important activity of this project. A report on 'Health Inequities in Maharashtra' which is based on secondary data has been published under this project, in 2008. Currently a report based on the analysis of state and district budgets with an equity lens is underway.

Nutrition being one of the key determinants of the health status of an individual is included in this project.

Structure of the Report

The report on, 'Nutritional Crisis in Maharashtra' consists of seven chapters. These chapters attempt to unravel the links between socioeconomic inequities and nutritional inequities in the state.

The first chapter of the report, '***Undernutrition in Maharashtra, a situation of crisis***,' is a situation analysis of malnutrition in Maharashtra. This chapter uses the data from the Maharashtra report of the third round of National Family Health Survey and the National Nutrition Monitoring Bureau report of 2005-06. The chapter gives statistics about adult malnutrition as well as child malnutrition. This chapter demonstrates the disparities in nutritional status of the population on the basis of their residence, gender, caste and class. The chapter also provides a comparative picture of undernutrition in Maharashtra to that of other select states.

The second chapter, '***Socio-economic Inequities in Maharashtra: An update***' explores inequities in the state of Maharashtra across regions as well as sub-groups of population in the indicators of income, poverty

and educational attainment among others. The chapter gives comparison of socioeconomic indicators of Maharashtra with other states such as Kerala, Tamilnadu, Bihar and Orissa. The chapter discusses rural-urban differences in poverty and the inequalities therein. The chapter delves into the Head Count Ratio of poverty by religion, by household's Principal Occupation, by Land Size and by Social Groups in Maharashtra. In addition to this, the chapter discusses the Human Development Index across districts. An analysis of agrarian crisis in Maharashtra is also one of the important sections of this chapter.

The subsequent chapter is on '***Calorie Deprivation in Maharashtra: Analysis of NSS Data***'. This paper explores calorie deprivation in Maharashtra across regions as well as sub-groups of population such as caste, size-class of land possessed, religion, and household type (indicating principal occupation of the household) for rural and urban areas separately. There are two aspects to the discussion. First, the inequities are explored with regard to average intake in terms of calorie, fat, protein and cereals. Second, incidence, depth and severity of calorie deficiency are analysed. In the latter calculation, a reduced calorie norm is used and in spite of this, incidences of calorie-poor to be 54% in rural areas and 40% in urban areas.

The next three chapters of the report, viz. ***Implementation of TPDS and Antyodaya in Maharashtra, Implementation of ICDS in Maharashtra and Implementation of Mid Day Meal Scheme in Maharashtra,*** are the evaluations of these key schemes being implemented in Maharashtra. The schemes like ICDS and Mid day Meal are aimed at providing supplementary nutrition to the nutritionally vulnerable groups such as children, pregnant and lactating women and adolescent girls, whereas the schemes like Targeted Public Distribution System and Antyodaya are supposed to address the food security issues of the Below Poverty Line population. These three chapters give details of the implementation of these schemes along with the problems.

The chapter on, '***Undernutrition, Ill-health and the Role of the Health System***' examines the role of health care in preventing undernutrition by effective community based management of infections as well as detecting undernutrition. This chapter analyses the vicious cycle of 'Infections and undernutrition' and demonstrates how these two are reinforcing each other. The chapter begins by outlining the burden of morbidity and mortality linked to undernutrition, primarily in the context of maternal and child health. It then accounts for mechanisms by way of which the vicious cycle of undernutrition perpetuates itself. Applying calculations of maternal and child morbidity and mortality to the state of Maharashtra, an attempt is made to calculate the number of child deaths, apparently due to infections but which can be attributed to undernutrition. These are avoidable deaths and healthy years of life lost. They can also be termed as 'excess' deaths, due to malnutrition. It then moves on to outline measures which need to be undertaken to break this vicious cycle.

Overall, this report is an attempt to describe the multifaceted nature of the problem of malnutrition in the state of Maharashtra.

Fifteen myths and facts about Food Security and Nutrition in Maharashtra

Fifteen myths and facts about Food Security and Nutrition in Maharashtra

(Certain critical points emerging from the report on 'Nutritional crisis in Maharashtra')

Myth #1: Maharashtra is a well off state so most people are well nourished.

Fact: Maharashtra's economic prosperity does not translate into adequate nutrition for more than half of the population. A large proportion of people in Maharashtra do not get enough to eat and are suffering from serious nutritional deficiencies.

Despite having one of the highest per capita net state domestic products in India, **over one-third of all adults in Maharashtra are underweight,** with a body mass index of less than 18.5 kg/m^2 and over 15% are severely underweight, with a BMI below 17.0 Kg/ m^2.[1]

Almost half the children under five in Maharashtra are stunted (too short for their age) and nearly one-fifth are severely stunted.[2] Stunting indicates the failure to receive adequate nutrition over a long period. Of children under three, 40% are underweight, 38% are stunted and 15% are wasted (too thin for their height) in Maharashtra.[3,4]

Nearly half the women in Maharashtra are anaemic, as are nearly 17% of men.[5] **Nearly two thirds of children in Maharashtra are anaemic,** with over 40% having moderate or severe anaemia.[6]

Myth #2: Maharashtra has a high economic growth rate so most people are becoming better nourished with time.

Fact: Maharashtra's social development is not commensurate with its high rate of economic growth. Despite a high growth rate, nutritional wellbeing for a large percentage of Maharashtra's population has stagnated and in some cases even declined.

Between 1994 and 2008, Maharashtra's per capita income increased more than one-and-a-half times. However, many measures indicate that over the same period its nutrition status has remained nearly stagnant. In the 1994 Indian Nutrition Index,[7] Maharashtra was ranked 13th out of the 15 states for which

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1 NFHS-3. (2005-06.) Ministry of Health and Family Welfare. Government of India.
2 *Ibid*
3 *Ibid*
4 Economic Survey of Maharashtra 2007-8. Accessed June 10, 2009.
http://unpan1.un.org/intradoc/groups/public/documents/apcity/unpan030171.pdf
5 NFHS-3. (2005-06.) Ministry of Health and Family Welfare. Government of India.
6 *Ibid.*
7 The Nutrition Index estimated by Wiesmann (2004) uses the same variables as the India State Hunger Index to enable comparison, i.e. child nutrition, child mortality and calorie undernourishment. The Nutrition Index differs in that it uses FAO dietary energy supply data for

the index was calculated. Maharashtra has made almost no progress in improving this poor ranking. After 14 years, in 2008, Maharashtra is still only 10th out of the 17 states for which the comparable Indian State Hunger Index[8] was calculated.

Maharashtra's economic growth rate has risen steadily, from an average of 5.0% per year from 1993 to 2001 to 7.8% from 2002 to 2007.[9,10] However, **per day consumer unit[11] calorie and protein consumption in Maharashtra has stagnated or declined since 1993.**[12] For example, consumer unit daily calorie consumption in urban areas dropped between 1993 and 2004-5 by over 170 calories, from 2432 to 2261.[13]

Myth #3: Maharashtra has a high per capita state domestic product and therefore is nutritionally better off than most other Indian states.

Fact: Despite having the second highest per capita net state domestic product (NSDP), Maharashtra's nutritional status is on par with Orissa and Bihar, both of which are much less developed.

Maharashtra's 2008 Indian State Hunger Index (ISHI) [14] score was 22.8, which places it 10th in India in the category of "alarming hunger" and on par with the less developed state of Orissa (23.8).[15]

Maharashtra's 2005-6 per capita NSDP was Rs. 37,081, more than double that of Orissa (Rs.17,610) and more than four times that of Bihar (Rs.7,875). Yet **Maharashtra and Orissa had comparable levels of stunting in children under four years** (around 45%) and underweight children under four (around 40%). **When it comes to underweight female adults (BMI <18.5 kg/m^2), Maharashtra (34%) is nearly on par with Bihar (35%).**

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estimating calorie undernourishment, and it uses prevalence of underweight among children under four years of age, rather than children under five years of age.

[8] The India State Hunger Index ranks on a 100-point scale, with 0 being the best score (no hunger) and 100 being the worst (complete hunger), though neither of these extremes is achieved in practice. Values less than 4.9 reflect low hunger, 5 to 9.9 is moderate hunger, 10 to 19.9 indicates a serious problem, 20 to 29.9 is alarming, and values exceeding 30 are extremely alarming.

[9] Economic Survey of Maharashtra (2005-6). Economic Outlook and Policy Imperatives. Accessed June 2, 2009. www.maharashtra.gov.in/english/ecoSurvey/ecoSurvey2005-06/eng/cha_2e.pdf

[10] Economic Survey of Maharashtra (2007-8). Part 1: Survey. Accessed June 5, 2009. http://unpan1.un.org/intradoc/groups/public/documents/apcity/unpan030171.pdf

[11] Household intake of calories, proteins and fats can be broken into consumer units by adjusting for the different requirements of each member. For example, a 20-39 year old male is 1.00 consumer unit while a female in the same age group is 0.71 consumer unit. This means that females in the age group need to consume 71% what men in the same group do.

[12] NSSO (National Sample Survey Organisation) (1996) *Nutritional Intake in India,* NSS 50th round, July 1993-June 1994, Fifth Quinquennial Survey on Consumer Expenditure, Report No. 405, Government of India.
NSSO (2001) *Nutritional Intake in India, 1999-2000*, NSS 55th round, July 1999-June 2000, Report No. 471 (55/1.0/9), Government of India.
NSSO (2007) *Nutritional Intake in India, 2004-05*, NSS 61st round, July 2004-June 2005, Report No. 513 (61/1.0/6), Government of India.

[13] *Ibid*

[14] The India State Hunger Index is computed by averaging the three underlying components of the hunger index: (1) the proportion of underweight children, (2) the under-five mortality rate (expressed as a percentage of live births), and (3) the prevalence of calorie undernutrition in the population.

[15] India State Hunger Index report published by International Food Policy Research Institute (IFPRI). Accessed May 16, 2009. http://www.ifpri.org/pubs/cp/ishi08.pdf

Internationally, in terms of its hunger index, Maharashtra is on par with Rwanda (22.3) and Cambodia (23.2), both countries with much lower per capita GDP.[16]

Myth #4: Undernutrition in Maharashtra is a problem only in a few remote tribal pockets.

Fact: Undernutrition is not just a problem "out there" in remote tribal or rural areas. There are millions of undernourished people living and working in Maharashtra's urban centres. Serious calorie deficiency can be found among people in all castes and religions.

The urban population of the coastal region, which includes the country's commercial capital Mumbai, has the highest prevalence of calorie deficiency (43%) in Maharashtra.[17] The coastal region is home to 44% of Maharashtra's urban population, yet has 51% of the state's calorie poor.[18] In Mumbai, 45% children are stunted (47% of slum children and 41% of non-slum children). This is higher than the average of stunted children in urban areas of the state, which stands at 42%. **Mumbai's economic growth is not translating into improved access to nutrition for the vast majority of its population**.

Caste-based analysis reveals that **the problem of undernutrition is not only severe among adivasis and dalits but is not only limited to them.** The data shows that tribes, scheduled castes, and other backward castes have high rates of rural calorie deficiency and female anaemia.[19] However, the rural 'Others' are not far behind with a rural calorie deficiency and female anaemia prevalence of 45% and 48%, respectively.

Analysis also shows that **undernutrition is prevalent across all religions**. Data available for women across the state reveals that 38% Hindu, 24% Muslim and 42% Buddhist women are undernourished, with BMIs below 18.5. Close to half of urban Muslims are calorie deficient, as are one-third of urban Hindus.[20]

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16 International Food Policy Research Initiative. (2008). Global Hunger Index. Accessed June 10, 2009. http://news.bbc.co.uk/2/hi/in_depth/7670229.stm

17 Calculated from schedule 1.0 of 61st round of National Sample Survey, 2004-05. NSSO (2007) *Nutritional Intake in India, 2004-05*, NSS 61st round, July 2004-June 2005, Report No. 513 (61/1.0/6), Government of India.

18 *Ibid.*

19 The prevalence of rural calorie deficiency among scheduled tribes, scheduled castes, and OBCs is 68%, 62%, and 48%, respectively; the prevalence of female anaemia is 59%, 52%, and 47%, respectively.

20 NSSO (2007) *Nutritional Intake in India, 2004-05*, NSS 61st round, July 2004-June 2005, Report No. 513 (61/1.0/6), Government of India.

Myth #5: The poverty line in Maharashtra identifies people who are generally poor and food insecure.

Fact: Depending on the norm chosen, 54% - 68 % of rural households and 40% - 58% of urban households are not getting enough calories[21]. However only 30.7% of the people in Maharashtra are classified as Below Poverty Line (BPL).[22] The official BPL designation excludes over 16 million people who are too poor to afford adequate food.[23]

The government defines poverty based on a family's income rate being below Rs.15,000. By this cut off, 30.7% of the population is officially BPL. However, the inability to access adequate nutrition is a much more robust measure of poverty. **Calculations made using a per consumer unit calorie norm of 2400 in rural and 2100 in urban areas, reveals that the incidence of calorie-based poverty is 54.1% in rural areas and 39.5% in urban areas.**

If we take the NSS norm of 2700 calories per consumer unit, then 68% of households in rural Maharashtra are not receiving adequate calories and should be considered 'poor'. If we take a corresponding but lower norm for urban areas at 2430 calories per consumer unit (90% of the 2700 calorie norm) then **58.1% of urban households in Maharashtra would be found not receiving adequate caloric intake.**

Swaminathan and Mishra highlight the arbitrary nature of BPL cut-offs in their case study of a Maharashtra village between 1995 and 2000.[24] They found that in 1997, when the government revised the BPL criteria to its current, more stringent, form, 54% of previously eligible households were excluded from BPL entitlements.

Myth #6: People with BPL cards in Maharashtra are generally poor and those that don't have BPL cards are well off.

Fact: Many impoverished people cannot access BPL cards while some relatively well off people have BPL cards.

Setting aside the problem of an arbitrary and unrealistically low poverty line, **even those who meet the BPL criteria face many problems in accessing BPL cards.** Many people who should have BPL cards cannot access them because of the use of targets and complicated application procedures. According to

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[21] Calculated from unit level data using schedule 1.0 of 61st round of National Sample Survey conducted during 2004-05. NSSO (2007) *Nutritional Intake in India, 2004-05*, NSS 61st round, July 2004-June 2005, Report No. 513 (61/1.0/6), Government of India.

[22] Planning Commission. (2004-5). Government of India. Accessed June 5, 2009. http://unpan1.un.org/intradoc/groups/public/documents/apcity/unpan030171.pdf

[23] Based on projected 2008 population of Maharashtra from Population Census 2001 (Economic Survey of Maharashtra 2007-8 p 233).

[24] Swaminathan, M. and Mishra, N. (2001). Errors of Targeting: Public Distribution of Food in a Maharashtra Village, 1995-2000. *Economic and Political Weekly 36*(26) p.2447-2454.

Ram, Mohanty and Ram's 2008 analysis, **65.4% of abject deprived households[25] in Maharashtra do not have BPL cards**.[26]

This denial occurs in part because villages and neighbourhoods are assigned BPL targets, beyond which no further BPL cards are distributed. For example, government authorities in a village of 1000 might be given a target of distributing 300 BPL cards. Yet this village may have 500 people with an income below Rs.15,000, leaving 200 genuine applicants without BPL cards.

In contrast to the millions of households in abject poverty that cannot access BPL cards, **12.7% of non-poor households posses BPL cards**.[27] Specifically, BPL cards are owned by 15% of families owning more than five acres of agricultural land, 5% who own a television and refrigerator and 7% with a motorized vehicle.

Myth #7: It is easy for poor people to access ration cards so they can benefit from the Targeted Public Distribution System (TPDS).

Fact: Millions of poor people are unable to benefit from TPDS's subsidized goods because of problems in qualifying as BPL and accessing ration cards.

In order to get a yellow or Antyodaya ration card, which enables the purchase of highly subsidized TPDS foodgrains at Fair Price Shops, one must first be classified as BPL. This is very difficult, as discussed in Myth #6. After getting a BPL card, one must get the corresponding ration card. **Applicants who cannot provide proof of residence, police certificates indicating 'good character' or the Rs.49 fee for a computerized card are regularly denied the much-needed ration cards**.

The National Centre for Advocacy Studies conducted a study in 2008 on access to ration cards.[28] One in every five BPL beneficiaries of TPDS interviewed faced difficulties while trying to get the card.[29] Barriers included lengthy wait times and the need to produce payments and documentation that they did not have.

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25 An abject deprived household is one that does not have any adult literate member, lives in a *kaccha* house in rural areas and in kaccha or semi pucca in urban areas, no land in rural areas and no toilet facility in urban areas, no drinking water facility of his or her own, not owning any consumer durables such as a bicycle, television or, radio and no electricity for his/her house. The deprivation score ranges from 0 to 6 where the score 0 is termed as abject deprivation. Based on criteria from: Srinivasan, K and S K Mohanty (2002): "Deprivation of Basic Amenities by Caste and Religion in India: An Empirical Study Using NFHS-Data", *Economic & Political Weekly*, XXXIX (7): 728-35, 14 February.

26 Ram, F., Mohanty, S.K., &Ram, U. (2008). Understanding the Distribution of BPL Cards: All-India and Selected States. *Economic and Political Weekly* xliv (7): 66-71.

27 *Ibid.*

28 Sharadkumar, Kamble, M., and Joseph, J. (2008). "Food to the Poor: A study of Implementation of the Food related schemes of the Government of India in Maharashtra" National Centre for Advocacy Studies, 1 February 2008.

29 Some information on number of people interviewed.

Myth #8: TPDS is procuring and providing enough food grains for the poor in Maharashtra. Fair Price Shops are fully catering to the needs of TPDS beneficiaries.

Fact: Despite large stores in government godowns, food allocated to various programs is consistently failing to reach the needy beneficiaries. Many Fair Price Shops make it extremely difficult for beneficiaries to buy their allotment of food grains.

Approximately 20% of food allocated to the state for BPL (i.e. AAY and yellow card) public distribution and 98% of food for APL does not end up reaching the beneficiaries. [30,31] Most of the food that goes unutilized is simply never picked up from government godowns for distribution to FPSs. Since state allocations are based on the previous year's utilization level, this **underutilization has led to a 40% reduction of Maharashtra's grain allocation since 2004**.

Further, in Sharadkumar, Kamble and Joseph's 2008 study,[32] **50% of BPL and Antyodaya beneficiaries stated that the grains were generally not available** when they visited the ration shop for purchase and one-third reported that even when grains were available there were not enough to get their full allotment.

The Indian Council of Medical Research suggests that each person requires about 11 kg of cereals per month.[33] An allocation of 35 kg per family would thus only sustain a family with consumption equal to three adults. Nonetheless all families, regardless of size, get only 35 kg. However, the following simple calculation illustrates that **the state falls grossly short of even providing this 35 kg per family per month**. There are 6.5 million yellow card families in the state and each is entitled to 35 kg of food per month. This means that in 12 months 2,744,280 tonnes of food need to be distributed from FPSs. However, government data shows that in 2006-7 only 1,557,950 tonnes ended up in FPSs. Thus, **the amount of food reaching FPSs is only half of what is required for every yellow card family** to get the 35 kg monthly ration.

TPDS is also supposed to provide rations to families above the poverty line (APL) that earn annually between Rs.15,001 and Rs.100,000. In Maharashtra there are 15.4 million of these families, which are still quite vulnerable to undernutrition and food insecurity. Despite being entitled to 35 kg foodgrains each month at a subsidized rate, **APL beneficiaries are almost completely excluded from TPDS**.

Many FPSs in Maharashtra have been found[34] to close early or keep irregular hours, making it hard for daily wage earners to access their provision. Many shops also tell beneficiaries they must buy their whole month's ration at once, which is impossible for poor people who can only afford to buy small amounts of food at a time. Shopkeepers have also been found to insist that TPDS beneficiaries buy some other, non-subsidized,

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30 Department of Food and Civil Supplies. (2007). Government of Maharashtra.

31 *Ibid.*

32 Sharadkumar, Kamble, M., and Joseph, J. (2008). "Food to the Poor: A study of Implementation of the Food related schemes of the Government of India in Maharashtra" National Centre for Advocacy Studies, 1 February 2008.

33 Department of Food and Public Distribution. (2003.) The Targeted Public Distribution System: Problems and Scope for Reform. Accessed June 8, 2009.
http://fcamin.nic.in/dfpd/EventDetails.asp?EventId=210&Section=High%20Level%20Committee%20Report&ParentID=0&Parent=1&check=0

34 Sharadkumar, Kamble, M., and Joseph, J. (2008). "Food to the Poor: A study of Implementation of the Food related schemes of the Government of India in Maharashtra" National Centre for Advocacy Studies, 1 February 2008.

item in their shop in order to access their TPDS quota. Since many of the intended beneficiaries cannot afford these goods they are forced to leave the shop without their food grains.

Myth #9: The Integrated Child Development Services data[35] that only 0.12% of children attending ICDS feeding centres in Maharashtra are severely (Grade III and IV)[36] malnourished is accurate.

Fact: ICDS feeding centres (i.e. Anganwadi centres) often do not weigh the children regularly or properly. Other research (both government and independent) suggests that a much larger portion of children are malnourished than that reported by ICDS.[37]

Grade III and IV undernourishment is grossly underreported by the ICDS. **Workers often lack the skills and equipment necessarily to accurate weigh and classify children. ICDS employees tend to underreport severe malnutrition in order to mask program failures**. In 2002, the Government of Maharashtra implemented an initiative to train feeding centre staff on proper weighing technique and equipped each participating centre with a scale.[38] Before the initiative, 7867 children had been reported as in Grade III and IV stages of malnourishment. Within a month, with improved data gathering and weighing efficiency, the number of children in Grade III and IV stages went up to 10,705. In 2005, the NGO Punarvasan Sangharsh Samiti (PSS) investigated the accuracy of government reports on child malnourishment in seven villages Akkalkuva tehsil. While the government reported only 34 cases of Grade III and IV malnutrition, PSS found 315 severely malnourished children.

The accuracy of the ICDS's reported Grade III and IV malnutrition rate is further called into question when compared to data produced by other surveys. The National Nutrition Monitoring Bureau of India uses the same four-level classification of malnutrition as does the ICDS. However they report that 3.3% of the children in Maharashtra are Grade III and IV malnourished—almost 30 times more than ICDS. It is possible that the children attending ICDS centres are better nourished since they are receiving supplementary meals whereas NNMB data includes all children in the state. However, 43% of children under 6 years old in Maharashtra go to feeding centres[39] and thus a substantial part of the NNMB's sample would include children who go to feeding centres. It is extremely unlikely that almost none of the severely underweight children found by the NNMB are coming to feeding centres. Although the National Family Health Survey III measures severe malnutrition based on different criteria,[40] it is nonetheless worth noting that they found 12% of the children in Maharashtra to be severely underweight.[41]

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35 Monthly Progress Report of Maharashtra, ICDS. (2009).

36 The ICDS uses the following weight-for-age classification: Normal weight is more than 90% of the standard weight for age. Grade I undernutrition is 81-90%, Grade II is 71-80%, Grade III is 61-70% and Grade IV is 60% or less.

37 Punarvasan Sangharsha Samiti (2005.) report on undernutrition in Akkalkuva tehsil, Nandurbar district, Maharashtra.

38 Ramani, V. (2005). Combating Child Malnutrition in Maharashtra: The Marathwada Initiative and the Road Ahead. Rajmata Jijau Mother-Child Health and Nutrition Mission Aurangabad, Maharashtra, India (A Mission of the Government of Maharashtra).

39 5,650,879 children below six years of age receive supplementary feeding in Maharashtra, out of 13,187,087 children below six years in total. Data accessed July 9, 2009 from http://www.icds.gov.in/

40 The NFHS classifies a child as severely underweight when his or her weight is less than three standard deviations below the average. For example, if a population of 10 year old children have an average weight of 30 kg and a sample standard deviation of 2 kg, then severely underweight is defined as being below 24 kg (i.e. 30-3x2).

41 NFHS-3. (2005-06.) Ministry of Health and Family Welfare. Government of India.

Myth #10: Severe malnutrition is the only problem that we need to be worried about.

Fact: Most malnutrition in Maharashtra is low grade and chronic, rather than severe. Long term mild and moderate malnutrition is a serious issue causing immense human suffering and millions of excess deaths and infections each year. It must not be normalized.

In India, severe undernutrition and death has attracted more attention and generated political pressure. Mild and moderate undernutrition has been underplayed despite the fact that around **74% of excess child mortality (estimated 33,300 excess deaths per year in Maharashtra) may be attributed to mild-to-moderate undernutrition.**[42] Mild-to-moderate undernutrition nearly doubles the risk of children under 5 years to die of infections.[43]

It must be recognised that mild and moderate undernutrition among under-five children is extremely common and this tends to be treated as 'acceptable' with inadequate response from the health system, which focuses attention only on severely undernourished children. It is only when children with Grade IV undernutrition manage to reach health care facilities that the Public health system goes into overdrive. However greater attention needs to be given to the entire spectrum of undernutrition, from mild to moderate to severe, instead of 'normalising' the widespread less severe grades of malnutrition which have serious impact in terms of morbidity and mortality. Just because a condition is common, it does not become normal or acceptable.

Myth #11: Deaths from malnutrition are rare, occasional occurrences isolated to a few pockets.

Fact: Malnutrition is so common in Maharashtra that is has been normalized, despite the fact that **about forty five thousand children and nearly 500 pregnant or in-labour women are dying each year of conditions where the underlying cause is malnutrition.**[44] Undernutrition increases the risk of infection, illness and death.

As discussed in Myth #10, most malnutrition in Maharashtra is chronic, rather than acute. Extensive research has found that undernutrition is the underlying cause of approximately half of child deaths in developing countries.[45,46,47,48] **Undernourished children are more susceptible to illnesses such as**

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[42] Pelletier, D.L., Frongillo, E.A. Jr, Schroeder, D.G., and Habicht, J.P. (1995). The effects of malnutrition on child mortality in developing countries. Bull World Health Organ. 5;73(4):443-

[43] Schroeder, D.G., Brown, K.H. (1994). Nutritional status as a predictor of child survival: summarizing the association and quantifying its global impact; Bull World Health Organ 72(4):569-79

[44] Pitre, A. (2009). Undernutrition, Ill-health and the Role of the Health System. Excess Morbidity and Mortality in Maharashtra.

[45] Pelletier DL, Frongillo EA Jr, Schroeder DG, Habicht JP; The effects of malnutrition on child mortality in developing countries; Bull World Health Organ.1995;73(4):443-8

[46] Rice AL, Sacco L, Hyder A, Black RE, Malnutrition as an underlying cause of childhood deaths associated with infectious diseases in developing countries. Bull World Health Organ. 2000;78(10):1207-21

[47] Savadogo LG, Ouedraogo HZ, Dramaix M, Sawadogo A, Sondo B, Tonglet R, Donnen P, Hennart P. Rev Epidemiol Sante Publique. 2002 Oct; 50(5):441-51

[48] Black R, Allen L, Bhutta Z, et al for the Maternal and Child Undernutrition Study Group. Maternal and child undernutrition: global and regional exposures and health consequences. Lancet 2008;
published online Jan 17. DOI:10.1016/S0140-6736(07)6169.

diarrhoea and acute respiratory infections and are less likely to survive them. In cases where they do survive, they are further weakened and susceptible to future illness.

Since undernutrition is the underlying cause of approximately 53% of under-five mortality in developing countries, this translates to around 45,000 child deaths per year in Maharashtra attributable to undernutrition.

Anaemia and short stature, both linked to chronic undernutrition, are common underlying causes of pregnancy-related morbidity and mortality. These conditions cause post-partum bleeding and increased risk of cephalo-pelvic disproportion requiring a caesarean section, respectively. These two factors account for 20% of maternal mortality.[49] **Hence in Maharashtra about 480 of the 2850 annual maternal deaths can be attributed to underlying undernutrition.**

A prospective cohort study was conducted in Mumbai to study the association of relative adult BMI with mortality. Being underweight was significantly associated with increased mortality in all under-weight categories, for both men and women. Extremely thin cohort members were at the highest risk for death by tuberculosis, cancer and respiratory diseases.[50]

Myth #12: Anaemia can be dealt with adequately just by giving iron tablets.

Fact: Anaemia must be addressed through improving the quality of food consumed. A course of iron tablets will go some way towards increasing haemoglobin in the short term. However tablets are an incomplete and short term solution. After finishing a course of supplements, most people return to the inadequate diet that led to the anaemia in the first place and will again become deficient.

Nutritional anaemia is not caused by an isolated deficiency of iron; it is caused by a deficiency of nutritious food. Anaemic people must receive adequate nutritious food during and after the course of supplementation with iron tablets. Although iron tablets will improve the haemoglobin count for a short time, haemoglobin levels are likely to fall again when the tablets stop, unless the patient's diet is improved in a sustained manner.

In a 2000 study of Mexican preschoolers,[51] multinutrient deficiencies were found to limit the capacity of children to increase haemoglobin stores when given iron supplements. The researchers attribute the lack of haemoglobin response to "general undernutrition, manifested by poor dietary quality and growth and possibly to vitamin B-12 deficiency specifically." They caution against public health interventions that deliver iron without regard for the possible need for other nutrients necessary for the formation of blood.

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[49] Black R, Allen L, Bhutta Z, et al for the Maternal and Child Undernutrition Study Group. Maternal and child undernutrition: global and regional exposures and health consequences. Lancet 2008;
published online Jan 17. DOI:10.1016/S0140-6736(07)6169.

[50] Pednekar, M.S., Hakama, M., Hebert, J.R., Gupta, P.C. (2008). Association of Body Mass Index with all-cause and cause-specific mortality: findings from a prospective cohort studying Mumbai (Bombay), India. Int J Epidemiol. Jun;37(3):524-35.

[51] Allen, L., Rosado, J., Casterline, J., López, P., Muñoz, E., Garcia, O., and Martinez, H. (2000.) Lack of hemoglobin response to iron supplementation in anemic Mexican preschoolers with multiple micronutrient deficiencies. Am J Clin Nutr 71:1485–94.

Myth #13: The Health care system is playing an adequate role in tackling undernutrition.

Fact: Despite mild and moderate undernutrition being the underlying cause of millions of deaths and illnesses, undernutrition tends to be trivialized or entirely overlooked by the public health care system, unless it is severe and accompanied by illness.

Medical professionals in public health facilities are not weighing and measuring children and adults on a regular basis to gather much needed data on the role of undernutrition in morbidity and mortality. The standard case sheets used by doctors in rural public health facilities do not have any separate space for weight, illustrating that doctors are not expected to weigh patients routinely. Furthermore, health professionals are not adjusting treatment programs and drug dosages for undernourished people. The public health system is not taking an active role in promoting measures to increase the nutritional status of those seeking medical care for infections and reproductive problems exacerbated by undernutrition.

Despite undernutrition being the underlying cause of much child and maternal mortality, clinicians tend to attribute deaths to infections or birth-related complications. Policy makers can thus attribute these deaths to infections and other compounding circumstances rather than underlying undernutrition.

Myth #14: The Mid Day Meal scheme is providing all school going children in Maharashtra with nutritious cooked school lunches.

Fact: An independent study reports that only 12% of the school children in the state are benefiting from the Mid Day Meal scheme; in addition approximate 100,000 children in the state do not attend school at all. Even if we look at the official data, there is a significant gap between the rhetoric of universal coverage and reality facing Maharashtra's schoolchildren.

A detailed, independent 2008 study of the MDM scheme in 91 villages in Maharashtra by Anna Adhikar Abhiyan found that **only 12% of schools investigated were providing cooked midday meals.**[52] Among the schools distributing food, most only provided cooked rice without any other supplements such as cooked dal and vegetables. This study also found that **not a single school was providing the stipulated 300 calories and 8 to 12 grams protein.**

In 2007, the Government of Maharashtra reported that 8.092 million school children in the state are benefiting from the MDM scheme.[53] Considering that there are 11.688 million school children in Maharashtra,[54] **even according to official data 14% of the school children in the state are not benefiting from the scheme.** In addition, approximately one third of the grains allotted to the state for the MDM program are not utilised by the scheme.

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[52] Findings of this study are available at Infochange India online: http://infochangeindia.org/200302035906/Agriculture/Books-Reports/Cooked-midday-meals-in-only-12-of-Maharashtra-s-surveyed-villages.html. December 19, 2008.
[53] Economic Survey of Maharashtra. (2007-08). Part 1: Survey. Social Sectors. Page 247. Accessed June 1, 2009. http://unpan1.un.org/intradoc/groups/public/documents/apcity/unpan030171.pdf
[54] *Ibid.*, page 245.

Myth #15: The problem of malnutrition can be dealt with fully through technically well designed supplementary inputs such as child feeding and micronutrient supplementation programmes.

Fact: The reality is that malnutrition is the visible end of a spectrum of problems emerging from current policies of the Government which put market at the center stage. Malnutrition represents widespread chronic hunger and is entrenched in the widespread poverty in Maharashtra. Hence although, supplementary nutritional programmes such as ICDS and Mid Day Meal scheme are essential as short term programmes to tackle child malnutrition, these programmes are not sufficient to eliminate the larger problem of food security.

It is essential to remember that malnutrition is not just a problem of lack of technical inputs or proper management; rather it is basically an issue of poverty, hunger and unequal distribution. Hence the solutions required to definitively tackle these problems have to be at a larger socio-political level and should not be reduced to fine-tuning technical quick fixes. There is an urgent need for redistributive policies, for equitable access to resources such as land, forests and water. In this larger setting, strong public systems to ensure universal food security as well as employment are essential.

Malnutrition is a complex problem resulting from unequal distribution of wealth and purchasing power. It is not just a technical-managerial issue of running feeding centres and distributing iron or vitamin pills. Well-run supplementary programs that reach each member of the target group will undoubtedly ease the burden of hunger in the short term and must be rigorously pursued. But advocates must not become so focused on the intricacies of these programs that they forget the deeper issues underlying Maharashtra's nutrition crisis.

Malnutrition results when people cannot access enough food, enough nutrients and calories over a prolonged period. It is not any overall shortage of food or resources in Maharashtra that is responsible for keeping such a large portion of people undernourished. Instead, there is a problem of unequal distribution of wealth and thus unequal capacity to access food. The distribution of resources and entitlements among members of society is determined by social and political structures and hence requires social and political solutions.

A narrow focus on technical or managerial responses to malnutrition masks the fact that large scale reduction of poverty is the only proven mechanism by which any society has eradicated undernutrition. A scenario stretching far into the future where poor children continue to survive on government lunches and women live in deprivation only to receive a course of iron pills during pregnancy is not ideal. The ICDS programme has been in operation since over three decades, yet malnutrition has not declined in a substantial manner. If fire-fighting strategies become permanent fixtures, and need to be continued indefinitely for decades, then perhaps more attention is required to identify the subterranean inferno which keeps these fires burning on such a large scale.

The ultimate purpose of examining the nutritional crisis in Maharashtra is to help work towards a situation where each family earns enough to eat well and live in dignity. All solutions to this situation must recognise that what is needed are not handouts, but rather the entitlement to every hand for the right to work; that the wounds of massive and growing inequities cannot be remedied by band-aids, rather they raise a fundamental question on the underlying economic model being pursued. Ultimately, people who struggle hard for survival yet still suffer the pain of seeing their children going to bed hungry night after night, will hunger not only for food but also for justice.

Chapter 1

Undernutrition in Maharashtra: A Situation of Crisis

Chapter 1

Undernutrition in Maharashtra: a situation of crisis

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Introduction

The Human Development Report of Maharashtra (2002) acknowledges that, 'despite Maharashtra's higher level of economic growth and being one of the higher-income States with growth rates that exceed that of several States, in terms of Human Development Index (HDI) Maharashtra ranks fourth in 2001 with a HDI value of 0.58'. (Human Development Report 2002)

Widespread undernutrition among children as well as adults is one of the indicators of the inequitable distribution of wealth in the state. The problem of undernutrition is not only restricted to low-income districts. Even Mumbai, the city with greatest amount of wealth in the country, has more undernourished children under five years than in urban Maharashtra as a whole (NFHS III 2005-6). Some areas such as Melghat in Amravati district, Nandurbar district and tribal areas of Thane district are infamous for undernutrition related deaths of children.

This chapter illustrates the gravity of undernutrition in Maharashtra. It presents the prevalence of malnutrition, anaemia, and food consumption shortfalls across Maharashtra's population by various disaggregates including age group, gender, caste, class and urban/rural location.

The data for this chapter are mainly from the third round of the National Family Health Survey (NHFS III) (2005-06) and the National Nutrition Monitoring Bureau Report (NNMB) (2005-06). In addition, wherever data are available, comparison between NFHS III and NFHS II (1999-98) is shown in order to highlight the trends in nutritional status. This chapter also discusses undernutrition at different ages (at birth, during infancy, in childhood and during adulthood). Maharashtra is compared to some other states and with the all India average to show where it stands.

I Nutritional status of children

Low birth weight in Maharashtra

Low birth weight is a major determinant of mortality, morbidity and disability in infancy and childhood and has a long-term impact on health outcomes in adult life (WHO 2009). Perinatal and neonatal mortality is estimated to be six to 10 times higher in low birth weight infants than those with average and above average birth weights (Bamji 2003). Low birth weight can be result of preterm delivery or intrauterine growth

retardation. The neonatal mortality rate[1] for the state is 26 per 1000 live births (2006), which means that every year around 48,000 children cannot survive beyond first month of life.

One fifth of babies born in India are of low birth weight (Kapil 2009). However, state level aggregate data on low birth weight is not readily available. The percentage of low birth weight infants[2] in Maharashtra in the year 2002-03 shows that 38% babies weighed less than 2500 Gms. (GoM 2009).

Table 1 Percentage of low birth weight babies in selected districts of Maharashtra

Name of the district	Wt Taken	<2000 Gm	2000 to 2500 gm	Total Low Birth Weight babies	>2500 gm	Wt Not Taken
Raigad	91	4	34	38	62	10
Ratnagiri	95	6	32	38	62	3
Sindhudurg	98	8	30	38	52	0

Source: Government of Maharashtra (2009)

In Maharashtra, only 64% of deliveries take place in health institutions (DLHS III 2007-8), hence around one third of newborn babies are not weighed. Analysis of 1,432 live births that occurred in the year 2000 in a health care facility in Thane district of Maharashtra revealed that the low birth weight babies comprised 35.68% and this percentage was higher for female newborns (Gurav, Kartikeyan, and Jape 2003).

Maternal undernutrition is one of the main causes of low birth weight. Besides maternal nutrition, higher maternal activity scores in earlier as well as later pregnancy were found to be associated with lower mean birth weight (Rao *et al.* 2003). In India, culturally women are rarely offered the luxury of rest or any special care during pregnancy. In addition, since the majority of the population is dependent on agriculture for subsistence, it is difficult for women to avoid laborious work during pregnancy. Hence, inadequate diet and hard work result in high prevalence of low birth weight babies.

Low birth weight has an adverse effect on health during childhood and into adulthood. An association between low birth weight and later insulin resistance, a strong risk factor for both cardiovascular disease and type II diabetes, has been established. Low birth weight has also been linked to higher blood pressure in children and coronary heart disease in adults in developing countries (Gopalan and Puri 1992; WHO 2009c; Butte, Lopez-Alarcon, and Garza 2002; Kramer and Kakum 2001).

Given the grave implications of low birth weight babies, it is essential to take efforts to improve the nutrition of pregnant women. However, currently the antenatal care prescribed under the Reproductive and Child Health (RCH) programme is only limited to provision of 100 iron tablets. While iron is important, it is not enough: Women need regular access to adequate quantities of wholesome food.

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[1] Neonatal mortality rate is the number of deaths during the first 28 completed days of life per 1,000 live births in a given year or period (WHO 2009b)

[2] Low birth weight is below 2500 grams at birth.

1.2 Nutritional status of infants

NFHS-III (2005-6) found that more than 20% of children less than six months were wasted (i.e. low weight-for-height) and an equal number were underweight indicating acute or chronic malnutrition. The level of stunting in this age group is around 15%. Approximately 30% of infants after six months are underweight, similar proportions are stunted and one fourth are wasted. More than one in 10 children in the age group 6 to 11 months is severely stunted, severely wasted or severely underweight.

Table 2 Nutritional status of infants according to age groups (< 6 months and 6-11 months) in Maharashtra

Age in months	Height-for-age		Weight-for-height		Weight-for-age	
	% below -3SD	% below -2 SD	% below -3SD	% below -2 SD	% below -3SD	% below -2 SD
	severely stunted	stunted	severely wasted	wasted	severely underweight	Underweight
<6	6.0	15.2	10.8	23.1	5.7	21.1
6-11	10.4	29.5	11.7	26.3	11.9	29.4

Source: NFHS-3, 2005-06

Infants in the age group zero to six months should be exclusively breastfed with proper breastfeeding technique; they can receive all needed nutrition from breast milk during this period (WHO 2009c; Butte, Lopez-Alarcon and Garza 2002, Kramer and Kakum 2001). This holds true even for babies of undernourished mothers (Gopalan and Puri 1992; Butte, Lopez-Alarcon, and Cutberto 2002). This finding is significant because it reveals that maternal food shortages need not lead to undernourishment in infants under six months. After six months, complementary food must to be introduced to meet the requirements of growing infant. It is essential to study breastfeeding practices as well as weaning practices to understand the cause of undernutrition in this age group. NFHS-3 data related to breastfeeding practices in the state reveals that only 53% of infants below six months of age were exclusively breastfed; others were fed either plain water or other milk in addition to the breast milk, which not only compromises nutritional intake but also exposes infants to the risk of infections.

After six months, the WHO (2009) recommends that breastfeeding continue up to two years but that complementary foods are also introduced. In Maharashtra, after six months, more than half the children were not offered complementary foods. The quantity of food required for meeting the nutritional requirement of infants is very small; hence unavailability of food in the household cannot be the reason for undernutrition in this age group. We need to look at other factors such as knowledge about feeding and availability of parental time to feed, to understand the situation. To overcome the problem of knowledge about feeding infants it is essential that supplementary feeding programmes like ICDS include teaching family members appropriate feeding options.

1.3 Nutritional status of children under five years of age

The level of malnutrition increases in children over one year in age. The severity of stunting in the age group one to five years indicates the chronic nature of this problem. In addition, the percentage of underweight children is also very high.

Table 3 Nutritional status of children between one to five years in Maharashtra

Age group in months	Height for age		Weight for height		Weight for age	
	% below -3SD	% below -2 SD	% below -3SD	% below -2 SD	% below -3SD	% below -2 SD
	severely stunted	Stunted	severely wasted	wasted	severely underweight	underweight
12-23	19.1	49.7	5.5	16.2	10.9	32.5
24-35	21.8	54.3	2.4	11.8	11.8	38.3
36-47	26.3	51.4	4.0	14.5	14.0	43.2
48-59	17.6	47.3	3.8	16.5	12.7	42.8
Total	**19.1**	**46.3**	**5.2**	**16.5**	**11.9**	**37.0**

Source: NFHS-3, 2005-06

Almost half the children in Maharashtra between one year and five years of age are stunted. One in six children is wasted (acutely malnourished) and one in three is underweight i.e. suffering from acute or chronic malnutrition. Amongst children between one and five years, those in the age group three to four years seem to be most vulnerable to chronic malnutrition. One fourth of the children between three and four years were severely stunted. The percentage of severe underweight (14%) is also higher in this age group.

Prolonged childhood malnutrition can impair mental development both directly (by compromising the structural development of the brain) and indirectly (by suppressing a child's motor activity and thus lessening environmental stimulation). The direct effect of malnutrition is believed to operate largely in the first two or three years of life (World Bank 1997).

To understand the reasons for such high prevalence of malnutrition in children between one and five years it is important to look at their consumption of essential nutrients. The NNMB survey shows that ***in Maharashtra less than one third of the children in the age group one to three years consume the recommended dietary allowances[3] (RDA) of calories and proteins.*** A large proportion of children (42%) get enough proteins but insufficient calories. One in four children does not get enough calories and proteins. In the age group of four to six years, only 27% consume adequate calories and proteins. Currently there is no available data on calorie and protein intake disaggregated by socioeconomic class.

[3] Recommended Daily Allowance (RDA) is the intake of nutrition derived from diet which keeps nearly all people health.

Table 4 Average intake of nutrients (per day) among children (age group one to six years) in Maharashtra

	1-3 year (n=266)	% RDA	4-6 year (n=272)	% RDA
Protein(g)	20.9	95	31.8	106
Total Fat(g)	12.9	51	16.3	65
Energy (Kcal)	699	56	1062	63
Calcium(mg)	277	69	298	75
Iron(mg)	6	50	10.2	57
Vit.-A (µg)	113	28	131	33

Source NNMB (2006)

The NNMB (2006) survey found that the average per day intake of nutrients, excepting proteins, for children one to three years old and four to six years old is grossly deficient. Children consume only 55 to 60% of required calories. Iron intake is only half the required quantity. Similarly, calcium, an essential mineral for bone development, is only consumed at 70 to 75% of the NNMB daily requirement of 400 mg.

Table 5 Average consumption of foodstuffs (g/day) among children in Maharashtra

	1-3 year (n=266)	%RDA	4-6 year (n=272)	%RDA
Cereals & Millets	113	65	197	73
Pulses & Legumes	19	54	26	74
Green Leafy Vegetables	2	5	4	8
Milk & Milk Prod.	107	36	75	30
Fats & oils	7	28	13	52
Sugar & Jaggery	15	50	20	50

Source: NNMB (2006)

The NNMB data on food consumption reveals that consumption of cereals and millets is only 65 to 73% of what children need. Children one to three years old are consuming only 54% of the required quantity of pulses and legumes. Consumption of fats and oils is also very low in this age group being less than one third of the RDA. Fats and oils are essential for the digestion, absorption and utilization of fat-soluble vitamins including A, D, E and K. It is essential to further disaggregate the undernutrition in this age group according to caste, class and gender. The NFHS-III (2005-6) survey provides the required information about this.

Table 6 Nutritional status of children under five years in Maharashtra across stratifiers: Caste categories, wealth index, place of residence and sex

	Height for age		Weight for height		Weight for age	
	% below -3SD	% below -2 SD	% below -3SD	% below -2 SD	% below -3SD	% below -2 SD
	Severely stunted	Stunted	Severely wasted	Wasted	Severely underweight	Underweight
Caste categories						
SC	23.4	55.2	6.6	20.2	13.5	41.7
ST	*30.0*	*57.8*	5.6	18.9	*21.2*	*53.2*
OBC	14.4	40.6	5.2	15.7	10.0	33.0
Others	16.9	42.5	4.4	14.6	9.6	32.6
Wealth index						
Lowest	32.9	63.5	5.9	18.2	18.8	51.8
Second	25.1	55.1	6.8	21.8	20.0	46.4
Middle	25.3	53.6	5.3	19.4	13.4	48.2
Fourth	16.4	45.1	5.8	16.1	10.2	32.4
Highest	7.2	28.9	3.3	10.8	4.5	20.9
Place of residence						
Rural	21.0	49.1	5.6	18.2	13.9	41.6
Urban	16.4	42.3	4.6	14.1	9.1	30.7
Sex						
Male	20.3	47.3	5.2	17.5	12.6	36.7
Female	17.7	45.1	5.2	15.4	11.1	37.3
Total	**19.1**	**46.3**	**5.2**	**16.5**	**11.9**	**37.0**

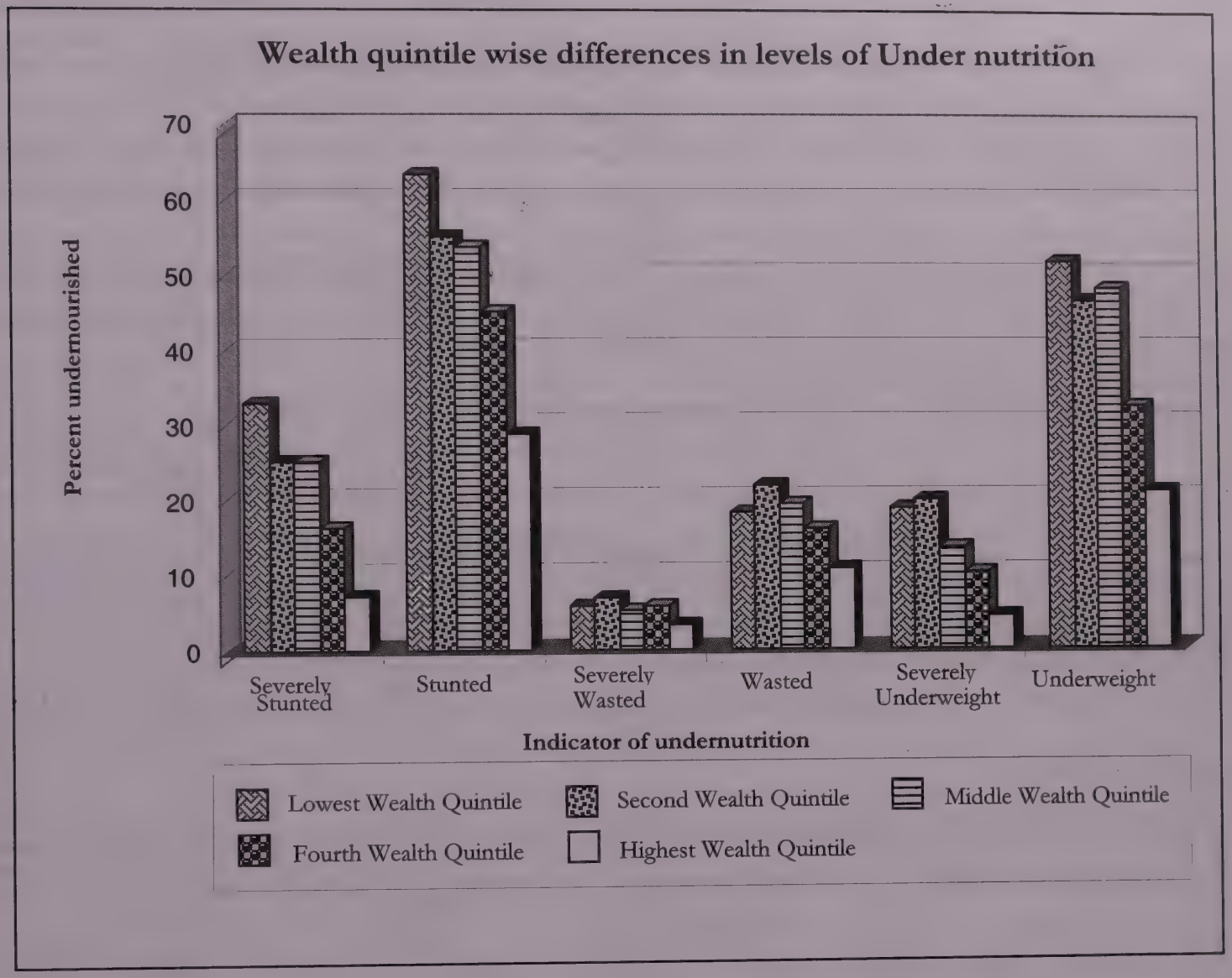
Source: NFHS-3 (2005-06)

In Maharashtra, almost one-fifth of children below five years are severely stunted. Among tribal people, the proportion is as high as 30%. More than half the children in ST population are underweight. The prevalence of severely underweight children is more than double among ST children, compared to the 'others' category.

Similarly, one third children in the lowest wealth quintile are severely stunted. The difference between the children in lowest wealth quintile and highest wealth quintile are quite stark. In cases of severe stunting and severe underweight, the difference between highest and lowest wealth quintile is more than four times. The extent of malnutrition bears an inverse relationship with the income of the household. This clearly links the problem of malnutrition with larger issues of poverty and food security in the household.

One-fourth of the children in the age group three to four years are severely stunted and almost 14% are severely underweight. As far as wasting is concerned, children six to 11 months are most vulnerable with 12% of children in this age group being severely wasted, the highest in all age groups. There is no apparent gender difference in the prevalence of undernutrition among children.

Figure 1 Wealth quintile wise differences in levels of undernutrition in Maharashtra



1.4 Prevalence of anaemia among children

As seen in Table 5, on average daily intake of nutrients among children, iron consumption in this age group is only 50 to 57% of the RDA. In addition to insufficient iron intake, folate deficiency is also an important cause of anaemia in India. Folate is required for the body to create red blood cells. One of the reasons for the high prevalence of anaemia is poor absorption of iron from diet. Iron absorption is inhibited by several substances including phytic acid (found in grains, legumes, and other plant foods), egg protein (from both the white and the yolk), tannic acid (in tea), and certain herbs. (Hurrell *et al.* 1999; Hurrell *et al.* 1988; Seshahdri *et al.* 1985). Lack of vitamin C makes some forms of iron inaccessible to the body (Teucher et al 2004; Fidler et al 2009).

Hookworm infestation also increases the likelihood of anaemia because the worms suck blood from the host's intestinal walls (Brooker, Hotez and Bundy 2008). De Silva *et al.* (2003) report a hookworm infection prevalence rate of seven percent in India although in some regions it can be as high as 25% (West Bengal) (Pal, Chattopadhyay and Sengupta 2007). Other gastrointestinal infections can also lead to chronic diarrhea and malabsorption of iron leading to anaemia. (Khosla, Dahiya and Dahiya 2002).

Table 7 Percent distribution of children in Maharashtra under age of five years with anaemia across stratifiers: Sex, caste categories, wealth index, place of residence and age groups

	Mild (10.0 -10.9 g/dl)	Moderate (7.0-9.9 g/dl)	Severe (<7.0 g/dl)	Any anaemia (<11.0 g/dl)
Male	22.3	41.2	**2.6**	66.0
Female	21.5	37.8	**0.9**	60.1
Caste categories				
SC	16.9	46.0	1.2	64.1
ST	23.1	42.0	2.5	67.6
OBC	23.2	36.4	2.8	62.5
Other	23.0	38.1	1.2	62.3
Wealth index				
Lowest	23.5	45.1	3.1	71.6
Second	19.2	45.9	2.4	67.5
Middle	17.7	40.1	2.6	60.5
Fourth	24.6	41.4	1.2	67.2
Highest	23.1	31.2	0.8	55.1
Place of residence				
Rural	20.8	43.6	2.4	66.8
Urban	23.4	34.3	1.0	58.7
Age group in months				
6-11	26.7	45.2	0.7	72.6
12-23	17.7	56.2	4.1	77.9
24-35	20.9	44.0	2.1	67.1
36-47	25.1	34.6	1.6	61.3
48-59	21.8	21.5	0.0	43.4
Total	**21.9**	**39.6**	**1.8**	**63.4**

Source: NFHS-3 (2005-06)

The prevalence of anaemia among children is even higher than the prevalence among adults. Around two-thirds of children under five years are suffering from anaemia. Prevalence is highest in the age group one to two years, among STs, those in the lowest wealth index quintile and those in rural areas. In all the three categories of anaemia, the prevalence is higher among male children than female children. In case of severe anaemia, the difference is almost three times. No test has been applied to assess the statistical significance of this finding. However, this finding poses questions to our understanding that our society being gender biased gives preference to male children in feeding; hence, there is a need to look into the reasons for the severity of anaemia in male children despite this preference.

In the case of severe anaemia, the difference between the lowest and highest wealth quintiles is almost four times. Similarly, the difference in severe anaemia rates between rural and urban children is almost two and a

half times. This difference can be attributed to availability of nutritious and adequate food to the children from highest wealth quintile and in urban areas.

A closer look at the age group differences in anaemia reveals that the children in the age group one to two years are most vulnerable. Children in this age group also largely remain outside supplementary nutrition programmes. It is thus imperative to modify the current ICDS scheme so that special supplementary nutrition is available to even smaller children.

Adish *et al.* (1999) examined the risk factors for iron deficiency in preschool children and identified inadequate environmental conditions, constrained maternal caring capacity, food insecurity and poverty as the risk factors for anaemia. Disease-related variables, such as diarrhea and fever, were moderately associated with anaemia. Sick children are known to have poor appetite and hence a low dietary intake. Low dietary intake in turn leads to low iron intake (Adish *et al.* 1999). This leads to the vicious cycle of malnourishment and illness.

1.5 Correlation between maternal nutritional status and child malnutrition

A closer look at the indicator weight-for-age, which signifies acute on chronic malnutrition, shows that almost half the children whose mothers are chronically energy deficient are underweight (Table 8). BMI is weight in kilograms divided by height in meters squared (kg/m^2). A cut-off point of 18.5 is used to define thinness or undernutrition and a BMI of 25 or above indicates overweight or obesity (Shetty and James 1994).

Table 8 Correlation between maternal nutritional status and child malnutrition in Maharashtra

Mother's BMI	Child height-for-age		Child weight-for-height		Child weight-for-age		Total number of children
	Percent below -3 SD	Percent below -2 SD	Percent below -3 SD	Percent below -2 SD	Percent below -3 SD	Percent below -2 SD	
Underweight (BMI<18.5)	21.0	51.6	5.3	20.9	16.6	45.7	963
Normal (BMI 18.5-24.9)	18.2	42.8	5.7	14.0	9.0	32.4	1,213
Overweight (BMI>25)	11.3	37.8	1.7	8.8	3.4	19.0	206
Mother not measured	(36.2)	(63.3)	(7.6)	(21.0)	(19.7)	(55.8)	54

Source NFHS-3 (2005-6)

The level of malnutrition among children whose mothers have normal BMI is also quite significant. Normal BMI of mothers indicates that there is enough food available in the household. It is puzzling that even in households where mothers have enough to eat significant numbers of children are undernourished. This underscores the fact that along with improving overall availability of food, it is also important to impart knowledge about the appropriate feeding practices to the caretakers of the child.

II Nutritional status of adolescents[4]

Due to the growth spurt during adolescence, the nutritional demands at this time are very high. The calorie requirement of boys in the age group 13 to 18 years is higher than the calorie requirement of an adult man with a sedentary lifestyle (Gopalan, Rama Sastri, and Balasubramanian 2002). However, the NNMB (2006) survey shows that among adolescents in the age group of 10 to 12 years, only 23% of boys and 25% of girls were consuming adequate calories and protein. In the age group of 13 to 15 years, only 27% of boys and 35% of girls were consuming sufficient calories and proteins. Overall, the percentage of children consuming an adequate amount of protein was higher than those consuming adequate calories in all categories.

The proportion of adolescents consuming sufficient calories and proteins was higher in the age group 16 to 17 years where around 46% of boys and 52% of girls were consuming adequate calories and proteins.

Table 9 Average consumption of foods (g/day) among 10-12 year boys and girls in Maharashtra

Food items	10-12 years			
	Boys (n=144)	% RDA	Girls (n=119)	%RDA
Cereals & Millets	284	68	286	75
Pulses & Legumes	28	62	28	62
Green Leafy Vegetables	7	14	7	14
Milk & Milk Prod.	63	25	50	20
Fats & oils	20	91	16	73
Sugar & Jaggery	25	55	26	58

Source: NNMB, 2005-06

The girls in the age group 10 to 12 years consumed only 14% of the RDA of green leafy vegetables and one fifth of the RDA of milk and milk products. This is the age of onset of menstruation resulting in rapid physiological changes. Each month, there is loss of iron during menses; hence, it is very important that adolescent girls consume enough dietary iron.

Table 10 Average intake of nutrients as percent RDA (per day) among adolescent boys and girls in Maharashtra

	10-12 years		13-15 years		16-17 years	
	Boys (n=144)	Girls (n=119)	Boys (n=122)	Girls (n=136)	Boys (n=82)	Girls (n=80)
Protein(g)	78	70	69	70	74	71
Total Fat(g)	92	77	103	96	111	94
Energy (Kcal)	64	70	66	74	72	73
Calcium (mg)	52	48	59	49	76	64
Iron(mg)	43	75	43	58	39	55
Vit A (µg)	24	22	35	28	35	35

Source: NNMB (2006)

[4] An adolescent is a person between 10 and 19 years of age (WHO 2009)

None of the age groups of adolescents were consuming enough food to provide them all the essential nutrients as per recommended dietary norms. The consumption of protein was around 70% of the required quantity. Except for 16 to 17 year-old boys, the intake of calcium was only around 50 to 60% of the requirement. Intake of vitamin A was only one third of the recommended quantity. Fat intake in higher in boys after 13 years of age than girls in the same age group, whereas the intake of iron is lower for males than females.

Table 11 Prevalence of anaemia among adolescent girls in Maharashtra

Anaemia level	Mild (10.0- 11.9 g/dl)	Moderate (7.0- 9.9 g/dl)	Severe (<7.0 g/dl)	Any anaemia (<12.0 g/dl)
Adolescent girls (Age 12- 14 years)	39.5	17.8	0.5	57.8
Adolescent girls (Age 15-17 years)	43.2	19.9	1.0	64.1

Source: NNMB (2006)

The NNMB data show very high levels (58-64%) of anaemia among adolescent girls in Maharashtra. A study by Brabin and Brabin (1992) indicates that the onset of menarche is delayed by an average of two years in undernourished girls, as is the adolescent height spurt. In developing countries, adolescent iron requirements are higher because infectious diseases such as malaria and hookworm contribute to anaemia and affect iron absorption.

III Nutritional status of adults

A BMI between 18.5 and 25 is considered healthy. Under 18.5 is considered to be undernourished or chronically energy deficient and 25 or above indicates that an individual is overweight or obese.

Table 12 Percentage of men and women (age 15-49 years) in Maharashtra with specific BMI levels

	Total thin (< 18.5 kg/m^2)	Moderately/severely thin (<17.0 kg/m^2)	Overweight/ Obese(≥25.0 kg/m^2)	Obese (≥30.0 kg/m^2)
Men	33.5	15.5	11.9	1.6
Women	36.2	17.0	14.5	3.6

Source: NFHS-3, (2005-06)

In Maharashtra, one third of adults are underweight (BMI <18.5 kg/m^2). In Maharashtra, 15.5% men have BMI less than 17.0 kg/m^2 indicating that they are severely undernourished. More women (36.2%) than men (33.5%) are undernourished and, similarly, more women than men are overweight. Almost 15% of women are overweight. The table above indicates that out of the total population, 45 to 50% are suffering from being either underweight or overweight.

A study was conducted in six villages (Chorghade *et al.* 2006) of Pune district in Maharashtra to study the gender differences in BMI. It revealed that being part of a farming household contributed to women being underweight. Other factors that were found to correlate with BMI were as follows:

1. **Type of work in which the household members were engaged:** Land wealth had a negative effect on women's BMIs, but was unrelated to men's BMIs. However, in 'cash wealthy' families, who had more access to amenities, owned more possessions, and consumed more oil, gender based discrimination was evident as the availability of resources did not translate into better nutritional status of women. The study observed that men consumed more milk, fruit, and snacks than women, although no differences in the consumption of non-vegetarian food were found.

2. **Types of family:** Joint families were associated with worse health outcomes for children and young women. The study found that both men and women in joint families to be thinner than those living in nuclear families.

3. **Female autonomy:** Women's lack of autonomy, especially limits on their freedom of movement, had a measurably negative effect on the quality of their diets.

4. **Level of education:** Men had higher BMIs in the households of better-educated women; although, for women, being better-educated was unrelated to their own BMIs. Men's level of education was unrelated to their own or to their wives' BMI.

5. **Fasting:** Women adhered more strictly to fasting practices than men. Recurrent fasting is one of the reasons for dietary deficiencies as the quantity as well as quality of the food items consumed during fast are inadequate to meet the body requirements.

Similar to low BMI, high BMI (i.e. above 25kg/m^2) is also a cause of worry as it increases risk of diabetes mellitus and hypertension. The NNMB (2006) report states:

> ... India is experiencing a rapid health transition, with rising burden of chronic diseases, which [is] estimated to account for 53% of all deaths and 44% of disability adjusted life years (DALY) in 2005. Hypertension is directly responsible for 57% of all stroke deaths and 24% of all coronary heart disease deaths in India. Several community based surveys revealed that hypertension is rapidly emerging as major public health problem even in developing countries. A study carried out during 2005 in different parts of India revealed that the prevalence of hypertension increased by about 30 times among urban communities and 10 times among the rural inhabitants during the past four decades. (NNMB 2005-06: 49)

The NNMB study revealed that the risk of having impaired glucose tolerance and diabetes mellitus was seven times higher among those having higher waist circumference[5], two to four times higher among those having higher waist hip ratio[6] and three to four times higher among those with BMI ≥25.

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[5] Waist circumference is measured at point mid way between the lowest margin of the ribs and the iliac crest. Adult men with waist circumference ≥ 102 cm and adult women with ≥88 cm are considered as having abdominal obesity

[6] Hip circumference is measured at point of maximum protuberance of buttocks. Adult men with waist hip ratio of ≥ 0.95 and women with ≥ 0.80 were considered as having abdominal obesity

Bays, Chapman and Grandy (2007) substantiated that the prevalence of diabetes mellitus and hypertension increased in an observable, linear fashion as BMI levels increased. The prevalence of diabetes mellitus was highest among morbidly obese individuals (BMI $\geq$ 40 kg/m^2), The same was true for hypertension, with highest prevalence among morbidly obese individuals.

Very low BMI (i.e. below 16.0) is associated with a mortality rate of 32.5 deaths/1000 per year as opposed to a mortality rate of 12.1 deaths/1000 per year in individuals with BMI 18.5. (Kurpad, Muthayya and Vaz 2005) Similarly, studies in industrial workers have shown that extremes of BMI (severe undernutrition and obesity) are associated with low productivity (Reddy *et al.* 1992).

Table 13 Average intake of nutrients (per day) among adult men and women (age ≥18 years) in Maharashtra

Category	Male Sedentary Workers	% RDA	Male Moderate Workers	% RDA	Female Sedentary Workers*	% RDA	Female Moderate Workers*	% RDA
n	311		832		468		649	
Protein (g)	53.8	90	57.8	96	43.2	86	48.5	97
Total Fat (g)	29.7	149	27.4	137	24.4	122	23.3	117
Energy (Kcal)	1791	74	1922	67	1479	79	1632	73
Calcium (mg)	428	107	394	98	352	88	346	87
Iron (mg)	18.7	67	21.2	76	15.1	50	17.8	59
Vit.-A (µg)	240	40	206	34	187	31	192	32

*Non pregnant non lactating (NPNL) Source : NNMB (2006)

The NNMB (2006) survey shows that protein consumption is adequate among adults; further, calorie consumption is only three-fourths of the overall requirement. Intake of iron is grossly deficient among women at only half the recommended quantity. Adults are consuming only a third of the recommended intake of vitamin A.

Fat consumption is much higher than the RDA across all categories. Sedentary males are consuming almost one and a half times more fat than recommended, other groups are also consuming more than is recommended for their activity level. One of the reasons could be the increase in intake of high fat food items such as fried snacks or bakery products. In the lower wealth index categories, people opt for fat laden snacks, as they are cheap whereas in higher wealth index categories, due to increased consumerism, more meals are now eaten outside home where fats are often used more liberally.

Table 14 Average consumption of foods (g/day) among adult men and women (Age ≥18 year) in Maharashtra

	Male Sedentary Workers (n=311) % RDA	Male Moderate Workers (n=832) % RDA	Female Sedentary Workers (n=468) % RDA	Female Moderate Workers (n=468) % RDA
Cereals& Millets	76.5	77.7	68.8	75.9
Pulses& Legumes	87.5	70	75	71.1
Green Leafy Vegetables	37.5	25	11	10
Milk& Milk Products	58.7	31	68	41.3
Fats & oils	130	120	110	100
Sugar & Jaggery	93.3	82.9	88.6	155

Source : NNMB (2006)

Intake of green leafy vegetables and milk products is very inadequate. Moderate workers who do more activity consume less pulses, green leafy vegetables and milk products than their sedentary counterparts do. The risk of cardiovascular diseases progressively reduces as the consumption of fruits or vegetables increases (Panagiotakos *et al.* 2003). There is some evidence too that omega-3 fatty acids, found in green leafy vegetables, nuts, vegetable oils and fish, may protect against a number of cardiovascular risk factors including diabetes. Both calorie excess and poor dietary quality are features of urbanisation and migration, especially among the poor, who buy highly refined, energy-dense food, while the better-off can afford a healthier mixed diet (Fall 2001).

3.1 Age-wise differences in BMI levels among women

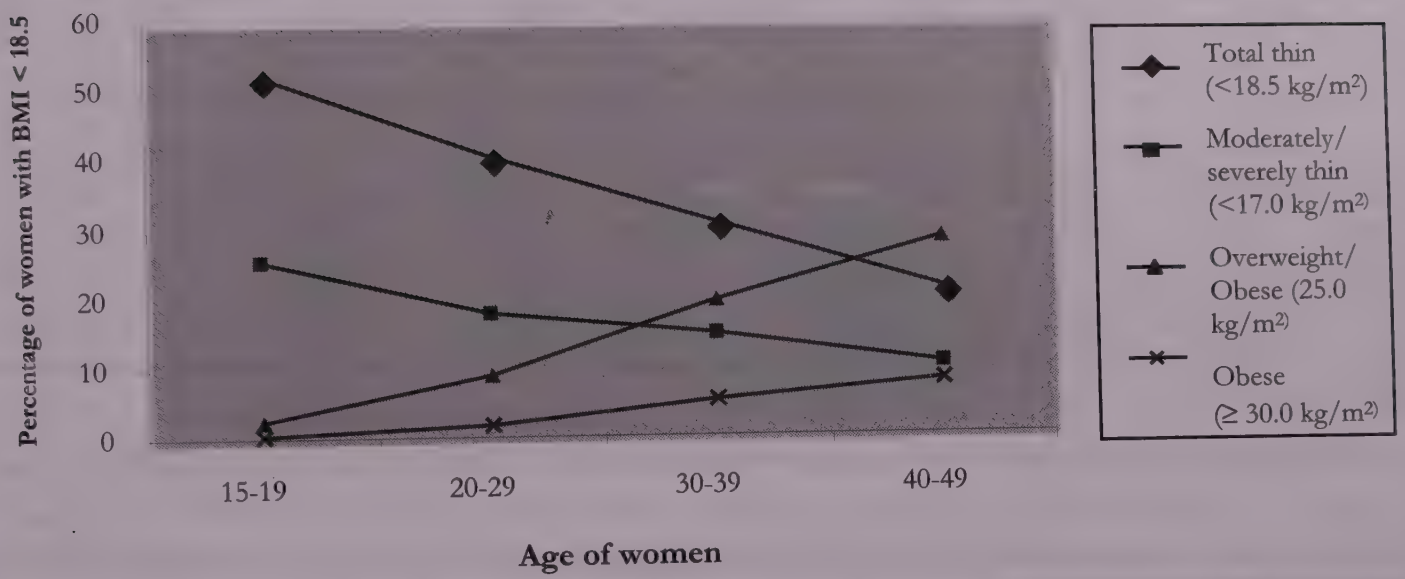
During adulthood between the ages 15 to 49 years, important physiological events such as menarche, pregnancy and menopause take place in females. In each of these stages, the nutritional requirements differ and inadequate fulfilment of this requirement takes a toll on health. Hence, it is essential to see age wise disaggregation in the levels of BMI.

Table 15 Percentage of women in Maharashtra (age 15-49 years) with specific BMI levels

Age-group in Years	Total thin (< 18.5 kg/m2)	Moderately/ severely thin (<17.0 kg/m2)	Overweight/Obese (≥25.0 kg/m2)	Obese (≥30.0 kg/m2)
15-19	52.1	25.3	2.5	0.2
20-29	40.4	17.9	9.0	1.8
30-39	30.7	14.8	19.6	5.0
40-49	21.3	10.4	28.4	8.0
Total	**36.2**	**17.0**	**14.5**	**3.6**

Source: NFHS-III, 2005-06

Figure 2: Age wise differences in BMI



As shown in the above graph, more than half the women in the youngest age group (i.e. 15 to 19 years of age) had BMI less than 18.5 kg/m^2. As age increases, there is some improvement in the nutritional status. However, elderly women are facing an additional risk of cardiovascular diseases associated with obesity as more than one fourth of women in the age group 40-49 years fall into the overweight category.

Severe undernutrition in younger women is detrimental not only to their health but also passes the burden of undernutrition to the next generation. The correlation between maternal undernutrition and low birth weight is well-established. (Reddy *et al.* 1992).

Fifteen to nineteen year old girls are most vulnerable as they are undergoing many physiological changes, especially related to the maturation of bones. Their requirements of calories and micronutrients like iron and calcium are heightened. Girls in this age group who are burdened with pregnancy coupled with inadequate supplements of energy and required nutrients are at high risk of delivering a baby with a low birth weight and of suffering complications in labour. Undernutrition is one of the largest causes of maternal mortality in India as compromised development of pelvic bones may lead to obstructed labour. Yekta, Porali and Aiatollahi (2005) studied the effect of pre-pregnancy BMI and gestational weight gain on pregnancy outcomes. Their research revealed that women with pre-pregnancy BMI below 19 gave birth to babies with mean significantly lower mean birth weights than women with BMI above 19.

The NFHS-3 (2005-6) survey shows that in Maharashtra, 28% of 19-year-old women have had a live birth. Thus, the low BMI in this age group is one of the important causes of maternal mortality and a high number of low birth weight babies in the state. The final chapter in this report further elaborates on this issue.

Table 16 Percent distribution of men and women (age 15- 49 years) in Maharashtra with specific BMI levels, across wealth index

Wealth Index	Total thin		Moderately or severely thin		Overweight or Obese		Obese	
	Men	Women	Men	Women	Men	Women	Men	Women
Lowest	52.0	56.7	25.6	24.9	1.3	2.1	0.0	0.5
Second	45.8	51.0	19.4	25.3	2.5	3.7	0.3	0.9
Middle	39.0	45.0	18.8	20.5	6.9	7.4	0.3	1.2
Fourth	31.9	31.9	14.9	14.4	11.0	13.9	0.9	3.0
Highest	22.2	23.4	10.1	11.5	21.9	26.3	3.8	7.1
Total	**33.5**	**36.2**	**15.5**	**17.0**	**11.9**	**14.5**	**1.6**	**3.6**

Source: NFHS-3, 2005-06

The malnutrition figures in the above table clearly indicate that nutritional status is directly correlated with economic status. As the wealth index goes up, nutrition levels improve. More than 50% of men and women in the lowest quintile are chronically energy deficient. Out of these 50%, half are severely undernourished. Though the percentage of the undernourished population reduces as we go up the wealth index, the proportion of undernourished men and women is significantly high even in the highest wealth index group; almost one fifth of the population is undernourished in this category.

The population in the highest wealth quintile is showing evidence of a nutritional transition where the number of women present in both the undernourished group as well as the overweight group is almost same. The proportion of obese women in the highest quintile is 7%, which is almost double the proportion of obese men in the same group.

Ramesh (2006) analysed trends, differentials and determinants of malnutrition among women in Kerala. This study substantiates that the economic condition of the household was one of the most significant predictors of malnutrition (includes both under-nutrition and over-nutrition). The prevalence of malnutrition varied significantly according to the household's living standard. Apart from household economic status, current age of women was also a significant predictor of both forms of malnutrition, where older women were more likely to be overweight or obese and younger women had a higher probability of being underweight or severely thin.

Table 17 Distribution of men and women (age 15- 49 years) in Maharashtra with specific BMI levels, across place of residence

Place of residence	Total thin		Moderately or severely thin		Overweight or Obese		Obese	
	Men	Women	Men	Women	Men	Women	Men	Women
Rural	39.8	45.6	18.1	20.7	6.5	6.9	0.7	1.1
Urban	27.7	26.6	13.1	13.1	16.9	22.3	2.4	6.1

Source: NFHS-3 (2005-06)

Differences in nutritional status based on place of residence are also quite stark. As far as under nourishment is concerned, ***almost 46% of women in rural areas are thin as compared to 27% in urban areas.*** Thus, there is a difference of almost 20 percentage points among women in rural and urban areas. In terms of being overweight, the obesity rate among urban men is more than three times greater than among rural men. Even more alarmingly, ***the obesity rate among women in urban areas is five times that of rural areas.***

There have been significant changes in food consumption patterns in Maharashtra. The weight differences between urban and rural people can be partly explained by different consumption patterns. The 2004-05 Nutritional Intake in India Report reveals that in Maharashtra's rural areas, the per capita per diem intake of fat (in grams) has gone up from 24 grams in 1972 to 41.5 grams in 2004-05. In urban areas, in the same period, fat consumption has gone up from 41 grams to 50 grams. Also, from 1972 to 2005, consumption of proteins has stagnated at 55 grams in rural areas and has declined from 55 to 52 grams in urban areas. This transition in the source of calories appears to have played a role in the increasing urban obesity rates.

Table 18 Distribution of men and women (age 15- 49 years) in Maharashtra with specific BMI levels, across caste categories

Caste categories	Total thin		Moderately or severely thin		Overweight or Obese		Obese	
	Men	Women	Men	Women	Men	Women	Men	Women
SC	38.8	39.9	19.1	19.8	10.3	12.1	0.8	2.5
ST	44.2	51.6	20.5	23.7	5.7	5.8	0.4	1.4
OBC	33.9	35.4	16.3	16.1	11.7	14.2	1.4	3.0
Others	29.2	31.9	12.8	14.9	13.9	17.5	2.3	4.9

Source: NFHS-3, 2005-06

Across caste categories, the levels of malnutrition are highest among tribal women, with more than 50% of these women having a BMI less than 18.5 kg/m^2. In the ST category, the difference between the percent of total thin men and total thin women is highest as compared to other categories. However, this finding contrasts the findings of researchers (for example Thekaekara 2007) that the matriarchal social order among many adivasi groups has led to less gender discrimination.

Women from the 'others' caste category, which is comprised of upper caste women, are more than three times more likely to be obese than women from scheduled tribes. However, even in the 'others' category around one-third women have BMI less than 18.5 kg/m^2.

According to World Bank estimates, malnutrition costs India at least US$10 billion annually in terms of lost productivity, illness, and death (Measham and Chaterjee 1999). Therefore, the existence of a double burden (under nourishment and obesity) poses a big challenge.

3.2 Prevalence of anaemia among adults

Like chronic energy deficiency, anaemia is also widespread among adults in Maharashtra.

Table 19 Percentage of women with anaemia in Maharashtra

Women	Level of anaemia			
	Mild[7]	Moderate[8]	Severe[9]	Any anaemia[10]
NFHS-3 (2005-06) (Age 15-49 years)	32.8	13.9	1.7	48.4
NNMB (Age ≥ 20 years)	39.5	26.9	3.1	69.5

NFHS-3 found that almost half of all women in Maharashtra are suffering from some type of anaemia. The high prevalence of anaemia is significant as anaemia is one of the leading causes of maternal mortality. The NNMB survey shows even higher level of anaemia of nearby 70%. The last chapter of this report discusses the significance of such high anaemia rates of and its contribution to maternal mortality in the state.

Table 20 Percentage of men with anaemia in Maharashtra

Men	Level of anaemia			
	Mild	Moderate	Severe	Any anaemia
NFHS-3 (2005-06) (Age 15-49 years)	10.1	5.9	0.8	16.8
NNMB (2006) (Age ≥ 20 years)	44.6	7.6	0.0	52.2

One in six men is suffering from some type of anaemia according to NFHS-3. The NNMB survey suggests significantly higher rates of male anaemia at almost 52 %. One of the reasons for significant difference could be the different age groups of the sample population covered in these two surveys. The NFHS survey gives prevalence of anaemia for men in the age group 15 to 45 years, whereas the NNMB survey includes all men above 20 years of age. In the survey, the mean Haemoglobin levels among adult men tended to decrease with age from 12.9 g/dl in 20-30 year group to 11.1 g/dl in the age group of 80 years.

Widespread anaemia among women can be explained by inadequate iron content in women's diets coupled with the loss of iron during menstruation and deliveries. Anaemia among men is caused solely by insufficient consumption of iron (men are consuming only 70% of RDA for iron). In the NNMB survey (2006), the prevalence of anaemia among adult men was found to be significantly associated with religion, community, type of house, major occupation of head of the household, literacy status, electrification of house, source of drinking water, and type of cooking fuel used.

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[7] Mild (12.0- 12.9 g/dl)for men and (10.0- 11.9 g/dl) for women
[8] Moderate (9.0- 11.9 g/dl) for men and (7.0- 9.9 g/dl) for women
[9] Severe (<9.0 g/dl) for men and (<7.0 g/dl) for women
[10] Any anaemia (<13.0 g/dl) for men and (<12.0 g/dl) for women

3.3 Class wise and caste wise differences in prevalence of anaemia among adults

Table 21 Percentage of men and women in Maharashtra (age 15- 49 years) with anaemia, across wealth index and caste category

	Mild		Moderate		Severe		Any anaemia		Any anaemia in women/ any anaemia in men
	Men	Women	Men	Women	Men	Women	Men	Women	
Wealth Index									
Lowest	17.5	35.0	8.5	17.7	0.8	2.7	26.8	55.3	2.1
Second	14.1	36.2	7.3	15.6	1.1	2.4	22.6	54.2	2.4
Middle	9.5	33.1	6.9	15.6	0.8	1.9	17.2	50.7	2.9
Fourth	8.6	32.6	5.1	12.9	1.2	1.5	14.9	47.1	3.2
Highest	8.0	30.6	4.8	12.0	0.4	1.1	13.3	43.7	3.3
Caste Category									
SC	10.5	35.3	9.2	14.6	1.0	2.1	20.6	51.9	2.5
ST	16.8	37.6	6.8	18.3	1.0	3.0	24.5	58.9	2.4
OBC	9.3	31.9	4.7	13.3	0.6	1.6	14.6	46.8	3.2
Other	8.9	31.3	5.4	13.1	0.9	1.3	15.2	45.7	3.0
Total	10.1	32.8	5.9	13.9	0.8	1.7	16.8	48.4	2.9

Source: NFHS-3 (2005-06)

As was seen with BMI, as economic class improves levels of anaemia decrease. However, as wealth increases, the gender difference in anaemia levels also increases. Anaemia rates among those in the lowest wealth quintile are twice as high among women as among men. However, among those in the wealthiest quintile, three times as many women as men have anaemia. The anaemia rate among the poorest women is almost four times higher than among the wealthiest men.

The highest rates of anaemia are among tribal women, where almost 60% are suffering from anaemia. Similarly, tribal women also have the highest rates of severe anaemia. Among men also, tribal men have the highest anaemia rates. Gender differences are crosscutting across all caste categories. There is not much difference between anaemia levels between those in urban and rural areas.

IV Nutrition during pregnancy

Pregnancy heightens the body's nutritional demands, requiring additional resources for proper fetal development. It is essential that pregnant women consume additional food to meet their bodies' heightened requirements. The ICMR recommends 2175 kcal for pregnant women with sedentary lifestyle; however, as shown in the following table, on an average pregnant women were consuming only 1500 kcal, which is 70% of the RDA. Similarly, consumption of calcium and iron were also grossly deficient; pregnant women are consuming only one third of the required amount of both these minerals.

Besides general poor availability of food, one of the important reasons for poor nutritional status among pregnant women is the observance of various food related taboos during pregnancy. For example, foods such as papaya, a rich source of *b*-carotene (vitamin A) is considered to be an abortificient and banana is believed to produce single-child infertility (Bamji 2003).

Table 22 Average intake of nutrients (per day) among pregnant and lactating women in Maharashtra

Category	Pregnant sedentary workers (n=28)	% RDA	Lactating sedentary workers (n=49)	% RDA
Protein (g)	43.6	67.1	51.5	68.7
Total Fat (g)	24.2	81	26.7	59
Energy (Kcal)	1509	69.4	1708	70.4
Calcium (mg)	363	36.3	358	35.8
Iron (mg)	14.3	37.6	19.7	65.7
Vitamin A (µg)	172	28.7	182	19.2

Source: NNMB, 2003

An exploratory study in conducted in 1989 in Parbhani to assess community nutrition problems and formulate recommendations for nutritional improvement states that

> ..... 'the need for increased food intake during pregnancy and lactation was not recognized; on the contrary, women ate less during pregnancy. This was not only because of decreased appetite, but was also the result of a desire to restrict the size of the baby and thus avoid a difficult childbirth. During pregnancy, the foods commonly avoided were papaya ("causes abortions"), sesame seeds ("induces bleeding, resulting in abortions"), and jaggery ("hot food, causes abortions"). No special foods were prepared for the pregnant woman, and her diet remained essentially unchanged throughout gestation. Also, sorghum rotis were believed to cause discomfort due to fullness and were, therefore, avoided for 1 week after delivery...' (Kashyap, P., Young, R.H.1989)

4.1 Anaemia during pregnancy

Almost three-fourths of pregnant women were found to be anaemic in NFHS-3, out of which 4% had severe anaemia. Anaemia during pregnancy increases the risk of maternal mortality and morbidity and affects foetal development.

To overcome the problem of anaemia during pregnancy, women are supposed to be given 100 iron tablets during pregnancy as part of the antenatal care provided by Government Health Services. However, the Pune Maternal Nutrition Study (Fall *et al.* 2003) showed that many women did not comply with the iron and folate supplements provided free. The paper stated that given the choice, women would prefer a good diet (for themselves and their families) to tablets.

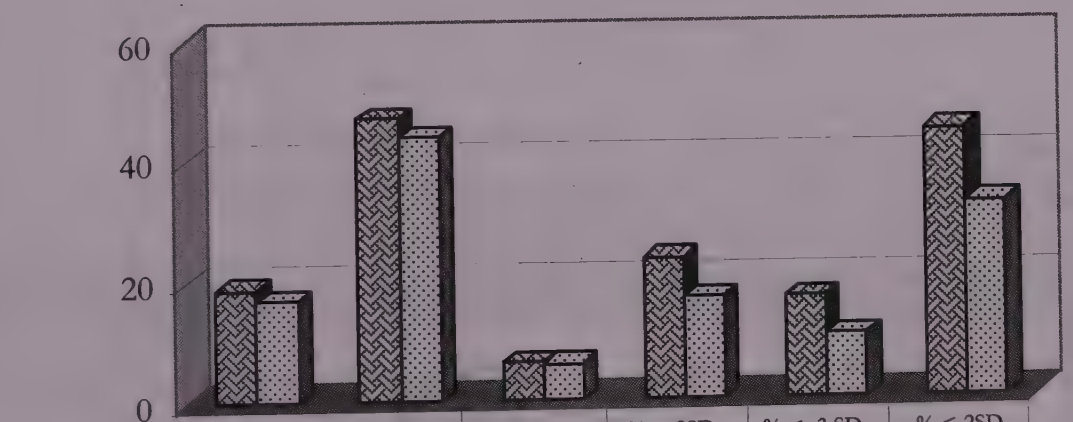
It is not only enough to give iron tablets to pregnant women; they should also be provided with information emphasizing the importance of taking these pills and efforts should be taken to ensure the availability of adequate amounts of nutritious food.

V Time trends regarding prevalence of malnutrition among adults and children

Undernutrition rates have always been high in Maharashtra. To overcome this problem, various schemes are being implemented by the state government such as the Integrated Child Development Service and Mid Day Meal scheme. Despite these efforts, there has not been a significant reduction in the prevalence of malnutrition. This section illuminates the trends in malnutrition by comparing NFHS-3 (2005-06) data with data from NFHS II (1998-99).

5.1 Comparison of nutritional status of children (age 0- 35 months) born to interviewed ever-married women in Maharashtra, from NFHS II (1998-99) and NFHS-3 (2005-06)

Figure 3 Comparison between nutritional status of children (Age 0- 35 months) born to interviewed ever married women, from NFHS II (1998-99) and NFHS III (2005-06)



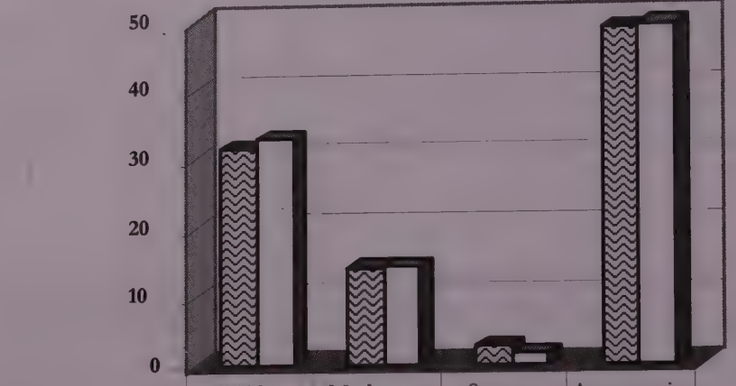
	%< -3 SD	% <-2SD	% < -3 SD	% <-2SD	% < -3 SD	% <-2SD
	Height for age		Weight for height		Weight for age	
NFHS II	19	47.1	6.4	23.6	17	44.8
NFHS III	17.2	44	6.2	17.2	10.7	32.7

Comparison between NFHS II and III reveals that there has not been much progress in reducing chronic undernutrition over the seven years between the two studies. There was only a two-percentage point drop in levels of severely stunted children and only a three-percentage point drop in levels of stunted children. The indicator of acute malnutrition (i.e. weight-for-height) shows some improvement for wasted children where there has been a 6% reduction. However, the prevalence of severely wasted children has remained constant over the seven-year period between NFHS II and III. The only indicator that has reduced by a considerable extent is the percentage of underweight children; there were almost 12% fewer underweight children in 2005-06 than in 1998-99.

5.2 Anaemia among ever-married women

Anaemia rates among ever-married women have increased between NFHS-2 and NFHS-3. Though the increase is very marginal, it indicates the failure of the state to address this issue.

Figure 4 Comparison between prevalence of Anaemia among ever married women (Age 15- 49 years) from NFHS II (1998-99) and NFHS III (2005-06)



	Mild	Moderate	Severe	Any anemia
NFHS II	31.5	14.1	2.9	48.5
NFHS III	32.9	14.4	1.8	49.1

Type of anaemia

5.3 Anaemia among children (age 6- 35 months)

Figure 5 Comparison between prevalence of anaemia among children (Age 6- 35 months) born to married women, from NFHS II (1998-99) and NFHS III interviewed ever (2005-06)

	Mild	Moderate	Severe	Any anemia
	Anemia level			
NFHS II	24.1	47.4	4.4	76
NFHS III	20.6	48.9	2.7	72.2

The prevalence of mild anaemia and severe anaemia among children has decreased slightly between NFHS II and III whereas moderate anaemia among children has increased slightly (by 1.5%).

VI Comparing Maharashtra with other states

In the previous sections of this chapter, we have discussed how the nutritional indicators of the population in Maharashtra are not commensurate with its economic growth. Despite Maharashtra's per capita net state domestic product (NSDP) being an impressive Rs.37,081 (GoM 2007), almost one-third of the state population officially belongs to the below poverty line (BPL) category which is widely recognised to be an underestimate. Income distribution in the state is highly inequitable and favours a small section of the population.

Table 23 Comparison of percent distribution of households according to Protein Calorie Adequacy status, across different states in India

		Protein deficient, calorie deficient	Protein deficient, calorie adequate	Protein Adequate Calorie Deficient	Protein Adequate calorie adequate
STATEE	**n**	**P- C-**	**P- C+**	**P+ C-**	**P+ C+**
Andhra Pradesh	798	24.3	.8	23.3	51.6
West Bengal	726	17.6	.1	33.3	49.0
Karnataka	773	25.4	.0	37.3	37.3
Pooled	**7078**	**26.4**	**.2**	43.8	**29.6**
Orissa	800	35.3	.5	35.3	28.9
Kerala	797	28.4	.4	44.0	27.2
Tamil Nadu	798	39.2	.3	36.3	24.2
Madhya Pradesh	797	22.7	.0	58.0	19.3
Maharashtra	796	26.0	.0	58.2	15.8
Gujarat	793	17.7	.0	67.2	15.1

Source: NNMB, 2003

The NNMB survey reveals that only 16% of the households in Maharashtra get enough calories and proteins. This is half compared to the pooled figure for all the states (30%). Among the states being compared, only Gujarat is below Maharashtra. Even Orissa has around 30% of households consuming adequate calories and proteins.

Table 24 Average household consumption of foods (g/CU/day) compared across selected states in India

State	N	Cereals & Millets	Pulses & Legumes	Green Leafy Vegetables	Milk & Milk Prod.	Fats & oils	Sugar & jaggery
RDA		*460*	*40*	*40*	*150*	*20*	*30*
West Bengal	726	477	18	41	49	18	10
Andhra Pradesh	798	449	30	6	112	18	10
Orissa	800	444	29	43	14	10	7
Karnataka	773	429	37	8	84	9	19
Madhya Pradesh	797	398	29	16	59	9	10
Total	7078	396	28	16	82	14	14
Tamil Nadu	798	386	37	10	102	12	11
Gujarat	793	333	20	9	170	21	11
Maharashtra	796	329	33	10	77	22	29
Kerala	797	320	23	7	66	6	18

Source: NNMB, 2003

Average consumption of cereals and millets in Maharashtra is 329g/CU/day whereas the recommended dietary intake is 460 g/CU/day. This gap is quite significant. This level of intake is one of the lowest among states compared. In contrast, the consumption of fat in Maharashtra is slightly higher than the RDA.

Table 25 Percentage of men and women (age 15- 49 years) with specific BMI levels for Maharashtra compared with selected states and India

Indicator	Kerala	Tamilnadu	Bihar	Orissa	Maharashtra	India
Women						
Mean BMI	22.6	21.6	19.4	19.7	**20.6**	20.5
Total thin	18	28.4	45.1	41.4	**36.2**	35.6
Moderately/ Severely thin	8.4	13.5	19.2	18.3	**17**	15.8
Overweight/Obese	28.1	20.9	4.6	6.6	**14.5**	12.6
Obese	5.0	5.1	0.6	1.1	**3.6**	2.8
Men						
Mean BMI	22.6	21.1	19.9	19.8	**20.5**	20.2
Total thin	18	27.1	35.3	35.7	**33.5**	34.2
Moderately/ Severely thin	8.4	12.3	13.7	12.5	**15.5**	13.8
Overweight/Obese	28.1	14.5	6.3	6.0	**11.9**	9.3
Obese	5.0	2	0.8	1.1	**1.6**	1.3

The table above reveals that the mean BMI of women in Maharashtra is almost equivalent to that of national average. The total number of thin women (BMI less than 18.5 kg/m^2) is slightly higher than the national figure. The total number of thin women in Maharashtra is double that of Kerala. Similarly, the number of overweight and obese women is slightly higher than the national average.

Malnutrition-related deaths in Melghat and other tribal areas

Over the last several years, news of high child mortality rates in tribal districts of Maharashtra have caused ripples in the media. However, this news has been quickly forgotten and malnutrition deaths have now become a routine features of these areas with little public outcry in mainstream media.

The Child Deaths Study and Action Group (CDSAG), has repeatedly spoken out about these malnutrition-related deaths and suggested that these death rates are being underestimated. A 2002 CDSAG study revealed that the neonatal mortality rate, infant mortality rate, and still birth rate are each underestimated by nearly 20 points in the Sample Registration Survey and National Family Health Survey. One of the most significant findings of this study was that in almost one-fourth of child deaths, malnutrition was found as a cause of death. There is an urgent need for proper policy measures to be implemented alleviate malnutrition in these areas. Subsequent chapters in this report review the schemes currently being implemented by the state of Maharashtra to address undernutrition (Bang, Reddy and Deshmukh 2002).

Rajmata Jijau Nutrition mission; An official response to malnutrition in the state

Between 2000 and 2001 fourteen child deaths were reported in the village of Bhadali, taluka Vaijapur, district Aurangabad. In response to this shocking incidence of child deaths, the Malnutrition Removal Campaign was launched in Aurangabad Division on 14 March 2002 focussing on the following important parameters:

(a) Complete (100%) survey of all children in the zero to six years age group.

(b) 100% registration of all such children.

(c) 100% weighing of all such children.

(d) On the basis of weighing, classification of all children as normal weight or as grade I, II, III or IV malnourished (as appropriate).

(e) Special concentration on children in grade III and IV stages of malnutrition; regular weighing, providing for health and nutrition measures for these children. Children in III and IV stages of undernutrition were to be weighed once a month, while other children were to be weighed once every six months.

(f) Initiating measures for ensuring health and nutrition of pregnant mothers to reduce incidence of low birth weight children.

(g) Greater attention to children in the zero to three years age group.

(h) Analysis of data to bring out the relative incidence of malnutrition based on age, gender and social status (scheduled caste/tribe).

Results: The initial number of children in the zero to six years age group in the grade III and IV stages of malnutrition in Aurangabad Division in July 2002 was 7867, as per the ICDS records. With improved survey and weighing efficiency, the number of children in grade III and IV stages of malnutrition went up to 10,705 in July 2002. *This increase substantiates CDSAG's claim that there had been significant underreporting in ICDS- in this case malnourishment rates were 136% the initial rate.* The subsequent concentration on grade III and IV children has seen the number come down to just over 3000 in March 2004. By April 2005, this figure came down below 500.

Banking on this experience, the government has launched the Rajmata Jijau Mother-Child Health & Nutrition Mission, which functions under the overall guidance and supervision of the Chief Minister.

A three-stage approach has been envisaged for the implementation of the malnutrition reduction programme:

(a) The first stage to cover the five tribal districts of Thane, Nashik, Nandurbar, Amravati & Gadchiroli

(b) In the next stage, the ten other districts with a high percentage of tribal population would be the focus of attention.

(c) The final stage would involve extension of the Mission to the rest of the state, especially areas like urban slums that have hitherto received lesser attention.

An independent evaluation to study the effectiveness of this programme is required.

There is clearly evaluation need for a comprehensive analysis of undernutrition in Maharashtra, a need that this report seeks to address. The subsequent chapters delineate the factors responsible for Maharashtra's high levels of undernutrition and explore the shortcomings and potentials of the programs in place to address them.

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Chapter 2

Socio-economic Inequities in Maharashtra: An update

Chapter 2

Socio-economic Inequities in Maharashtra: An update[1]

Srijit Mishra[2]

Abstract: This paper explores inequities in the state of Maharashtra across regions as well as sub-groups of population in the indicators of income, poverty and educational attainment among others. Maharashtra is among the richer states in India, but this has not adequately translated into poverty alleviation - the proportion of poor has always remained around the national average and in 2004-05 it is higher than the national average by three percentage points. Over the years, inequality in consumption expenditure has increased. Agriculture's share in the state income was around 12% in 2006-07, but as per 2001 census, more than half the workers in the state are dependent on this sector. Four districts with predominantly urban populations contribute to more than half of the state's income and the recent growth can be largely attributed to urban centric services or capital-intensive manufacturing. Despite this recent growth, comparable estimates of poverty for recent years (1999-2000 to 2004-05) indicate an increase in urban poverty. The increasing incidence of farmers' suicides and the state of agricultural indebtedness are only symptoms of the larger agrarian crisis. With regard to literacy, the state has always had greater attainment than the national average. At higher attainments, one would consider lower gender disparities, but this has not been the case. An updated human development index reiterates the regional divide - districts in Konkan and Western Maharashtra are relatively better placed than Marathwada, Vidarbha and Khandesh. The much talked about Maharashtra Employment Guarantee Scheme has largely been successful as a relief measure in drought prone areas and not as a poverty alleviation measure.

Key words: Declining child-sex ratio, Education, Farmers' suicides, Group (gender/regional) differential, Gini coefficient, Human development, Income, Poverty.

JEL Code(s): D30

Introduction

Maharashtra throws a number of paradoxes. It is among the richest states of India, but its head count ratio of poverty has remained around the national average. In 2005-06 current prices, the per capita net state domestic product (NSDP) of Rs.37,081 was lower only than Haryana among major states. Maharashtra's gross state domestic product (GSDP) of Rs.4,324,130 million was 13% of the gross domestic product of India. Mumbai, the state's capital city, is the commercial and financial capital of India and contributes more than one-third of the country's direct tax. The head count poverty estimate in 2004-05 was at 31% for the state, which is higher than the national average of 28%. The state can boast of entrepreneurial farmers growing Alphonso mangoes, grapes, onions, oranges and sugarcane among other crops, yet in some regions like western Vidarbha there is a high incidence of farmers' suicides. The first lady doctor to graduate in

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western medicine and the first female President of India hails from this state and its infant mortality rate (IMR) of 35 per 1000 live births in 2006 is much lower than the national average of 57. However, the child sex ratio of 913 in 2001 is among the lowest across all states and is a matter of serious concern. What is more, the child sex ratio is lower in urban areas (908) and in the economically better-off region of Western Maharashtra.

In this current exercise, we further delve into the temporal and spatial patterns of some socio-economic inequities in Maharashtra. This will serve as a background to the larger exercise on health inequities in the state. Before doing that, section two provides some broad developmental indicators from Maharashtra and other selected states as well as that of India. Sections three to five will look into trends in income, poverty and education respectively in the state. Section six provides an updated Human Development Index (HDI) for districts of Maharashtra. Section seven gives a brief outline of the agrarian scenario in the state with a special emphasis on farmers' suicides, an aspect that is not only relevant from a socio-economic perspective but also from a public health perspective. Concluding remarks have been given in section eight.

Comparing Socio-economic Indicators

In terms of area and population, Maharashtra is a large entity – it constitutes a little less than one-tenth of the country's share on both counts. Its population density is lower than that of India. It is difficult to bring in a comparable state of similar size. As the purpose of the current exercise is to provide some background information on health inequities, we select states based on our common knowledge on health indicators: the relatively better off Kerala and Tamil Nadu and the relatively worse off Bihar and Orissa. We will also compare Maharashtra to the all India average.

Maharashtra is closer to Tamil Nadu in terms of the proportion of urban population (more than two-fifths), literacy rate (70+ percent), gender gap in literacy rate (18+ percentage points), life expectancy at birth (64-70 years), infant mortality rate and human development index.[3] With a relatively higher literacy rate when compared to Tamil Nadu one would expect the gender gap (male-female) in literacy rate to be lower, but it is higher. Similarly, with a relatively higher life expectancy and relatively lower infant mortality rate, one would expect some gender parity. What is intriguing is that Maharashtra has a very low sex ratio and it is among the lowest in the 0-6 age-group. In 2001, the national average for overall sex ratio is 933, while the same for Maharashtra is 922. The child sex ratio for India is 927, while it is as low as 913 in Maharashtra. This is reflective of social and medical practices that discriminate against the female fetus/child. Maharashtra's low child sex ratio also indicates regular violation of the Pre-Conception and Pre-Natal Diagnostic Techniques (PCPNDT) Act, 2002 (Mulay and Nagarajan 2005).[4]

[3] For a discussion of determinants of child mortality in poor human development districts see Ashtekar et al. (2004).

[4] The question of gender discrimination has wider dimensions – a recent study points out that at an aggregate level the state is withdrawing from the social sector leading to adverse impact on women. At the same time, the state's policy interventions of empowering women through Self-Help Groups (SHGs), though welcome, are not enough (Patel 2003). There is also a view that Information and Communication Technology (ICT) can be used to address some gender disadvantage by allowing women to work from home and upgrade their skills. However, some market and non-market distortions need special attention to tap this potential (Goyal 2007).

Table 1 Socio-economic Indicators in Maharashtra, Selected States and India

Indicators	Kerala	Tamil Nadu	Bihar	Orissa	Maha-rashtra	India
Geographical area (lakh sq.km.)	0.4	1.3	0.9	1.6	3.1	32.9
Total population, 2001 (million)	31.8	62.4	83.0	36.8	96.9	1028.6
Population density, 2001 (persons per sq.km.)	819	478	880	236	314	324
Decadal increase in population, 1991-2001 (%)	9.4	11.2	28.4	15.9	22.6	21.3
Urban population, 2001 (%)	26.0	43.9	10.5	15.0	42.4	27.8
Literacy rate, 7+years, 2001 (%)	90.9	73.5	47.0	63.1	77.3	65.4
Gender gap in literacy, 2001 (%age points)	6.5	18.0	26.6	24.8	18.8	21.7
Life expectancy, Male, 2006-11 (years) #	72.0	68.5	67.5	61.4	67.7	65.6
Life expectancy, Female, 2006-11 (years) #	75.0	71.5	67.1	61.2	71.1	67.2
Birth rate, 2006 (per '000 persons)	14.9	16.2	29.9	21.9	18.5	23.5
Death rate, 2006 (per '000 persons)	6.7	7.5	7.7	9.3	6.7	7.5
IMR, Persons, 2006 (per '000 live births)	15	37	60	73	35	57
IMR, Urban Male, 2006 (per '000 live births)	11	33	43	52	25	37
IMR, Rural Female, 2006 (per '000 live births)	17	41	64	76	42	64
Sex ratio, 2001 (females per '000 males)	1058	987	919	972	922	933
Sex ratio, 0-6, 2001 (females per '000 males)	960	942	942	953	913	927
Per capita NSDP, 2005-06 (Rs)@	30668	29958	7875	17610	37081	25956
Share of Agr &Allied in GSDP, 2005-06 (%) @	16.8	13.5	28.0	24.6	12.4	18.8
Total workers, 2001 (%)	32.3	44.7	33.7	38.8	42.5	39.1
Cultivators in workers, 2001 (%)	7.0	7.8	29.3	29.8	28.7	31.7
Agricultural labourers in workers, 2001 (%)	15.8	13.9	48.0	35.0	26.3	26.5
Proportion BPL, Persons, 2004-05 (%)†	15.0	22.5	41.4	46.4	30.7	27.5
Proportion BPL, Rural, 2004-05 (%)†	13.2	22.8	42.1	46.8	29.6	22.9
Proportion BPL, Urban, 2004-05 (%)†	20.2	22.2	34.6	44.3	32.2	22.2
Stunted (<-2SD), 0-4 years, 2005-06	24.5	30.9	55.6	45.0	46.3	48.0
Wasted (<-2SD), 0-4 years, 2005-06	15.9	22.2	27.1	19.5	16.5	19.8
Underweight (-2SD), 0-4 years, 2005-06	22.9	29.8	55.9	40.7	37.0	42.5
BMI <18.5 Kg/m², 15-49 years male, 2005-06	18.0	18.4	45.1	41.4	36.2	35.6
BMI >25.0 Kg/m², 15-49 years male, 2005-06	28.1	20.9	4.6	6.6	14.5	12.6
BMI <18.5 Kg/m², 15-49 years female, 2005-06	21.5	27.1	35.3	37.5	33.5	34.2
BMI >25.0 Kg/m², 15-49 years female, 2005-06	17.8	14.5	6.3	6.0	11.9	9.3
Scheduled Castes, 2001 (%)	9.8	19.0	15.7	16.5	10.2	16.2
Scheduled Tribes, 2001 (%)	1.1	1.0	0.9	22.1	8.9	8.2
Human Development Index, Value, 2001	0.64	0.53	0.37	0.40	0.52	0.47
Human Development Index, Rank, 2001§	1	3	15	11	4	-

Note: Census information at the all India level excludes Mao-marum, Paomata and Purul sub-divisions of Senapati district in Mizoram. # Life Expectancy at birth. @ Provisional estimates in current prices for the year 2005-06; NSDP=Net state domestic product, GSDP=Gross state domestic product, Agr.=Agriculture. † Proportion Below Poverty Line (BPL) is based on official estimates using uniform recall method calculated from National Sample Survey by the Planning Commission. § Human Development Index ranks are across 15 major states. Stunted, wasted and underweight refer to below two units of standard deviation from the median of the international reference population 2006 with regard to height-for-age, weight-for-height and weight-for-age respectively. BMI denotes body mass index where <18.5 Kg/m² and >25.0 Kg/m² indicate thin and fat individuals respectively. The former (latter) are identified as greater risk factors for communicable (non-communicable) diseases.

Source: Census of India, 2001; Economic Survey of Maharashtra 2007-08; National Family Health Survey (NFHS-3), 2005-06, India, Volume I; http://www.censusindia.net (accessed 23 May 2007); http://www.indiastat.com (accessed 11 September 2008); http://mospi.nic.in/ (accessed 11 September 2008) and http://pib.nic.in/archieve/others/2007/mar07/2007032102.xls (accessed 22 May 2007).

As indicated earlier, in 2005-06, at current prices, the per capita net state domestic product in the state is among the highest in the country, yet the incidence of poverty is higher than the national average and is higher than that of Kerala and Tamil Nadu where per capita income is lower. The share of agriculture and its allied activities in GSDP is around 12%, which is lower than that in Kerala and Tamil Nadu, but the proportion of total workers dependent in agriculture (cultivators plus agricultural labourers) at 55% is nearly two-and-a-half times that of these states.

The proportion of stunted (<-2 Standard Deviation (SD) in height-for-age) and underweight (<-2 SD in weight-for-age) children are much higher than that in Kerala and Tamil Nadu and close to that of Orissa. In this context, a matter of grave concern, particularly for the tribal children, is the reported cases of malnutrition and starvation deaths. The nutritional situation in urban areas, particularly in slums, is also alarming (Hatekar and Rode 2003). If we combine thin (<18.5 Kg/m^2 body mass index (BMI)) and fat (>25.0 Kg/m^2 BMI) people, as these are identified with greater risk for communicable and non-communicable diseases respectively, then Maharashtra has the highest levels in India.[5]

Scheduled castes and scheduled tribes are considered vulnerable groups who suffer from multiple deprivations. The former are spread across the state residing in close proximity with the overall population and would have access to health or other public infrastructure but for their social and economic exclusion. The latter reside in relatively inaccessible regions-mountains and forests-and largely suffer from physical exclusion.[6] One should be careful in an analysis of vulnerability to include these two groups. Now we discuss inequities within the state in terms of income, poverty and education.

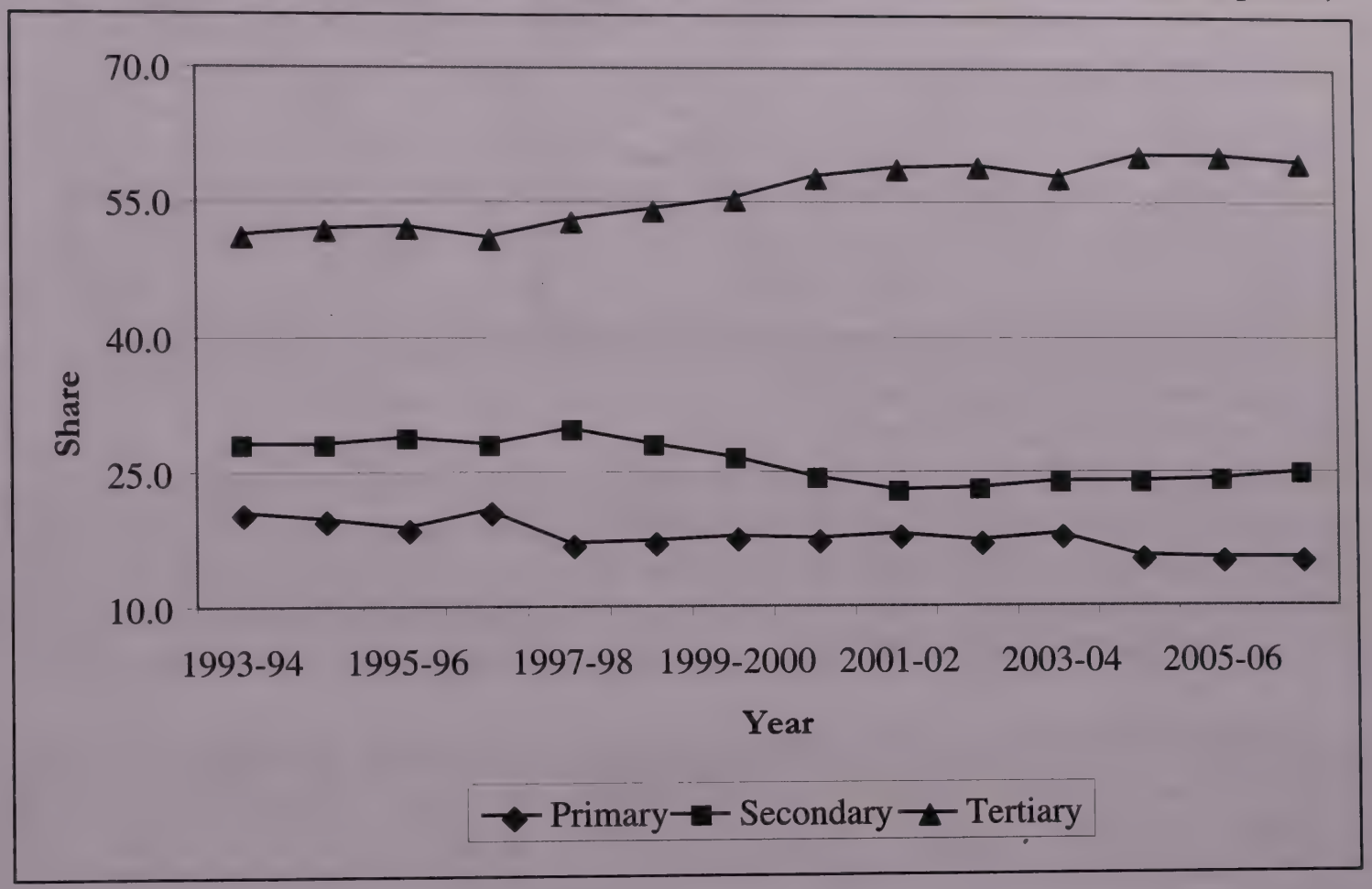
Inequities in Income

In 1999-2000 constant prices, the NSDP increased from Rs.1,579,730 million in 1993-94 to Rs.3,251,480 million in 2006-07. The sectoral share of NSDP (Figure 1) indicates a secular decline in the primary sector. The secondary sector showed some increase in its share that peaked around 1997-98 and then declined until 2001-02. After 2001-02, the secondary sector share has been increasing. The tertiary sector's share has shown an increasing trend from 51% in 1993-94 to 60% in 2006-07. The linear trend growth rate for the period under analysis indicates an increase of 5.0% per annum for NSDP (95% confidence interval (CI) being 4.4-5.7). The sectoral linear trend growth rates of 3.0% per annum for the primary sector (95% CI being 2.3 to 3.8), 3.3% per annum for secondary sector (95% CI being 1.9 to 4.7) and 6.5% per annum for tertiary sector (95% CI being 6.0 to 6.9) also substantiate the phenomenal growth in the tertiary sector.

[5] Duggal (2008) discusses the inequities in nutritional deficiencies, mortality, morbidity across regions and social groups and Lingam and Pitre (2008) discuss the inequities in gender dimensions including reproductive health.

[6] Among others, Velaskar (2000) is a recent discourse on the state of scheduled castes in Maharashtra. Similarly, Mutatkar (2007) discusses disparities at an all India level using National Sample Survey data, but also dwells about intra-group disparities between tribals based on a village study in Maharashtra.

Figure 1 Sectoral Share in Mahrarashtra's NSDP, 1993-94 to 2006-07 (1999-2000 prices)



The relatively lower growth in the primary sector is also evident in agriculture where the linear trend growth rate is 3.2% per annum (95% CI being 1.8 to 4.7). This primary sector growth rate, however, does not tally with recent calculations made with old series data till 2004-05 where the agricultural trend growth rate turned out to be much lower: 0.7% per annum (95% CI being -0.5 to 2.0). In any case, the relatively lower growth in agriculture is of concern because, as indicated earlier, in Maharashtra, unlike Kerala or Tamil Nadu, a substantial proportion of the workforce continues to be dependent on agriculture. Even in industry, as Mishra and Panda (2006) point out, there seems to be a shift away from labour-intensive to capital-intensive industries.

Now, we elucidate some regional patterns within Maharashtra.[7] In terms of administrative divisions, Konkan, which also comprises Greater Mumbai, has seen the greatest increase in population share from 1993-94 to 2006-07. This disproportionate increase can be attributed to large-scale migration to this region from all over the country. However, when it comes to share of NSDP, the increase has largely been in Nashik and Pune divisions.

[7] A dated but comprehensive analysis on uneven regional development, particularly emphasizing public intervention backlogs, is the Dandekar committee report on *Regional Imbalance in Maharashtra* (Government of Maharashtra 1984).

Table 2 Share of Population and NSDP across Divisions, 1993-94 and 2004-05

Divisions	Population		NSDP (1993-94 prices)	
	1993-94	2006-07	1993-94	2006-07
Amravati	10.6	10.1	7.9	6.2
Aurangabad/Marathwada	16.3	15.9	11.2	10.0
Konkan	24.6	26.4	39.4	37.3
Nagpur	11.4	11.0	10.4	9.5
Nashik	16.4	16.0	11.5	14.0
Pune	20.8	20.6	19.5	23.0
Maharashtra	100.0	100.0	100.0	100.0

Source: District Income of Maharashtra (soft copy), Directorate of Economics and Statistics, Government of Maharashtra, 2008.

In Table 3, annual growth of per capita income in Maharashtra from 1993-94 to 2006-07 across divisions indicates that the decline in the primary sector is in the administrative divisions of Konkan and is not significant for Amravati, Aurangabad, and Nagpur. In the secondary sector, the growth is not significant in Aurangabad, Konkan and Nagpur. For the tertiary sector, the growth is not significant for Amravati, Aurangabad and Nagpur. Overall, per capita income growth is significant only in Nashik and Pune.

The estimates of 2006-07 at constant 1999-2000 prices indicate the following. More than 37% of the state's income is accounted for by the Konkan region. If one takes the highly urbanized districts of Greater Mumbai, Nagpur, Pune and Thane then they together account for 48% of the state's income. The state's average per capita income is Rs.30,750. Across districts, Greater Mumbai has the highest per capita income at Rs.48,851, which is nearly 60% more than the state's average. In contrast, Washim has the lowest per capita income of Rs.15,590, which is around 50% of the state's average.

Table 3 Annual Growth rate of Per capita Income across Divisions in Maharashtra, 1993-94 to 2006-07 (1999-2000 prices)

Divisions	Primary		Secondary		Tertiary		NSDP	
Amravati	0.7		2.2	*	0.5		0.7	
Aurangabad/Marathwada	1.0		1.3		1.5		1.2	
Konkan	-2.7	*	-0.2		2.6	*	1.4	
Nagpur	-0.2		1.8		2.3		1.5	
Nashik	4.0	*	3.2	*	4.6	*	4.0	*
Pune	2.3	*	3.0	*	4.6	*	3.6	*
Maharashtra	1.2	*	1.5	*	3.1	*	2.3	*

Note: # Linear trend growth rate, b in $\ln(Y_t)=a+bt$; t=time, which has been calculated using net domestic product and * indicates that the growth rate is significantly different from zero at 95% confidence interval.
Source: District Income of Maharashtra (soft copy), Directorate of Economics and Statistics, Government of Maharashtra, 2008.

Poverty and Inequality

Trends in the estimates of incidence of poverty in Maharashtra and India based on thick rounds of consumption expenditure from the National Sample Survey (NSS) indicate the following. The proportion of people below the poverty line in Maharashtra has consistently remained around the national average.[8] It decreased from 53% in 1973-74 to 43% in 1983 and then to 37% in 1993-94 and further reduced to 31% in 2004-05. Between 1993-94 and 2004-05, rural poverty declined from 38% to 30% whereas urban poverty declined from 35% to 29%. Comparable estimates for 1999-2000 and 2004-05 indicate that in Maharashtra rural and urban poverty declined by 1.5 and 2.2 percentage points respectively over a period of five years. In either of the methods the corresponding declines at the all India level has been higher. What is much more intriguing in recent years (1999-2000 to 2004-05) is the near stagnation of the rural poverty rate and the increase of urban poverty in Maharashtra. This reinforces the understanding that the rural/agrarian sector, as in large parts of the country, is under a larger crisis; but the urban situation is not rosy either. This urbanisation of poverty brings forth a number of issues such as the non-availability of public services (Dilip and Duggal 2003), the problem of hawking, a source of livelihood for a large number of the urban poor (Bhowmik 2001), the resettlement of slums in the name of larger development (Contractor *et al.* 2006), the precarious situation of individuals residing in the non-notified slums (Chandrasekhar and Mukhopadhyay 2007), and the greater vulnerability of women (Deosthali and Madhiwala 2005) among others.

Table 4 Percentage of Poor and Percentage points Decline, Maharashtra and India

Year	Maharashtra			India		
	Rural	Urban	Total	Rural	Urban	Total
	Percentage of poor					
1973-74	57.7	43.9	53.2	56.4	49.0	54.9
1983	45.2	40.3	43.4	45.7	40.8	44.5
1993-94	37.9	35.2	36.9	37.3	32.4	36.0
2004-05a	29.6	32.2	30.7	28.3	25.7	27.5
1999-2000	23.7	26.8	25.0	27.1	23.6	26.1
2004-05b	22.2	29.0	25.2	21.8	21.7	21.8
	Decline (percentage points per annum)					
1983 over 1973-74	1.3	0.4	1.0	1.1	0.9	1.1
1993-94 over 1983	0.7	0.5	0.6	0.8	0.8	0.8
2004-05a over 1993-94	0.8	0.3	0.6	0.8	0.6	0.8
2004-05b over 1999-2000	0.3	-0.4	0.0	1.1	0.4	0.9

Note: The above are official estimates given by the Planning Commission. In 2004-05, the 'a' estimates are based on uniform recall period and comparable with 1993-94 whereas the 'b' estimates are based on mixed recall period and comparable with 1999-2000.
Source: Mishra and Panda (2006) and http://pib.nic.in/archieve/others/2007/mar07/2007032102.xls (accessed 22 May 2007)

[8] This is independent of the debate on comparability of the estimates of 1999-2000 because of some change in the recall period during survey. The recent survey of 2004-05 gives the possibility of comparing poverty estimates in both the methods. In 2004-05, the percentage of poor in Maharashtra is higher than the all India average by more than three percentage points in either of the methods.

Turning to the distributional aspect, the National Sample Survey Organization (NSSO) consumption expenditure survey data confirms the prevalence of a high disparity within the state. Per capita monthly consumption expenditure (MPCE) in Maharashtra for rural and urban areas in 2004-05 was Rs.568 and Rs.1148 respectively. Among India's 17 major states, Maharashtra's percentage difference in urban to rural average MPCE at 202% is the fifth highest. In comparison to all 35 states/union territories of India, Maharashtra's Gini coefficient for per capita consumption expenditure at 0.31 in rural areas is the fifth highest and at 0.371 in urban areas is the eighth highest. The Gini coefficient ratio of consumption expenditure in rural and urban Maharashtra is higher than the all India average. It also indicates that inequality has increased over the years (Table 5).

Table 5 Gini Coefficient of Consumption Expenditure in Maharashtra and India

Year	Maharashtra				India			
	Rural	GR (%pa)	Urban	GR (%pa)	Rural	GR (%pa)	Urban	GR (%pa)
1983	0.291	-	0.349	-	0.308	-	0.341	-
1993-94	0.306	0.49	0.357	0.22	0.286	-0.68	0.343	0.06
2004-05	0.311	0.14	0.378	0.53	0.297	0.35	0.373	0.80

Note: GR=Growth Rate (percentage per annum).
Source: Dev and Ravi (2007) and NSSO (2006)

Religion wise incidence of poverty indicates that in urban areas Muslims, Buddhists and scheduled castes, scheduled tribes and other backward classes among Hindus have a head count ratio of poverty that is higher than the state average. In rural Maharashtra, Buddhists and both scheduled castes and scheduled tribes among Hindus have a head count ratio of poverty that is higher than the state average. Further, these groups also have a greater share of poor compared to their population shares (Table 6). Among Muslims, 71% of the population are in urban areas whereas the share of poor Muslims in urban areas is 84%. This is a matter of concern.

Table 6 Head Count Ratio of Poverty By Religion in Maharashtra 2004-05 (%)

Region	Indicator	Hindus					Mus-lims	Budd-hists	Oth-ers	All
		STs	SCs	OBCs	Oth	All				
Rural	Poverty Ratio (HCR)	56.5	43.9	23.9	18.2	28.8	26.4	46.3	4.1	29.6
	Population Share	13.4	8.7	35.1	31.5	88.6	4.7	6.1	0.6	100.0
	Share of Poor	25.6	12.9	28.4	19.4	86.3	4.2	9.5	0.1	100.0
Urban	Poverty Ratio (HCR)	40.4	42.2	33.8	17.0	27.0	54.7	44.1	9.7	32.1
	Population Share	3.0	11.2	22.7	36.3	73.1	17.2	5.8	3.8	100.0
	Share of Poor	3.7	14.7	23.9	19.2	61.5	29.3	8.0	1.1	100.0

Note: ST, SC and OBC denote scheduled tribe, scheduled caste and other backward class respectively. HCR denotes Head Count Ratio.
Source: Calculated from unit level data.

In Maharashtra, there are about 42.7 million employed people (work force) in 2004-05 and of these, 67% were in rural and the rest in urban areas. From the total work force, 82% worked in the unorganised sector and 90% of total workers are unorganised. The latter is higher because nearly half of the workers in the organised sector were also unorganised. Estimates of poverty for the unorganised sector in 2004-05 suggest that compared to the all India average it is higher in Maharashtra in both rural and urban areas (NCEUS 2007). Incidence of poverty by households' principal occupation indicates that it is higher than the state average for agricultural labourers (Table 7). These households constitute 37% of the population share but nearly three-fifths of the share of poor in rural Maharashtra. In urban Maharashtra, incidence of poverty is as high as 77% for individuals whose households' principal occupation is casual labour. These households constitute 11% of the population share but more than a quarter of the poor in urban Maharashtra.

If one takes into consideration the size-class of land possessed then the incidence of poverty is higher than that of rural Maharashtra for landless (possessing less than or equal to 0.1 hectares of land) or marginal households. These households have a population share of 39% and 23% respectively, but their share of poor is 48% and 24% respectively (Table 8).

Table 7 Head Count Ratio of Poverty by Households Principal Occupation, Maharashtra, 2004-05 (%)

Rural	Indicator	Agr Labour	Other Labour	Self-emp., Non-agr	Self-emp., Agr	Other	All
	Poverty Ratio (HCR)	47.3	30.9	21.4	18.2	8.0	29.6
	Share	36.7	9.2	11.5	34.3	8.3	100.0
	Share of Poor	58.8	9.6	8.3	21.1	2.2	100.0
Urban	**Indicator**	**Casual Labour**	**Self-emp**	**Regular Wage/ Salaried**		**Other**	**All**
	Poverty Ratio (HCR)	76.7	32.8	23.0		13.7	32.1
	Population Share	10.9	37.0	47.3		4.7	100.0
	Share of Poor	26.0	37.8	34.0		2.0	100.0

Note: Agr and emp denote agriculture denotes employed respectively.
Source: Calculated from unit level data.

Table 8 Head Count Ratio of Poverty By Land Size, Rural Maharashtra, 2004-05 (%)

Indicator	Landless	Marginal	Small	Semi-Medium	Medium	Large	All
Poverty Ratio (HCR)	36.1	31.7	26.8	17.4	19.7	14.3	29.6
Population Share	39.1	22.5	16.0	13.4	7.6	1.4	100.0
Share of Poor	47.7	24.2	14.5	7.9	5.0	0.7	100.0

Note: Landless: less than or equal to 0.1 hectares of land, Marginal: 0.1-1 hectares, Small: 1-2 hectares, Semi-Medium: 2-4 hectares, Medium: 4-10 hectares, and Large: >10 hectares.
Source: Calculated from unit level data.

Incidence of poverty will vary by social group as well as by region. The poverty estimates in 2004-05 across rural and urban regions for four categories of social groups: scheduled tribes (STs), scheduled castes (SCs), other backward classes (OBCs) and others are given in Table 9. The ST and SC groups have a substantially higher incidence of poverty. The proportion of poor among rural STs at 56% is nearly double the 30% for rural Maharashtra. The ST group accounts for 26% of the total rural poor against a population share of 14%. The SC group accounts for 23% of the total rural poor against a population share of 15%. Incidence of rural poverty is 19% for the Others category, which includes upper-caste Hindus, and the group's poverty rate is nearly a third compared of the STs. Disparity in incidence of poverty across social groups in urban areas is relatively low-it varies from 43% for the SC population to 27% for Others.

Table 9 Head Count Ratio of Poverty By Social Groups, Maharashtra 2004-05 (%)

Region	Indicator	ST	SC	OBC	Others	Total
Rural	Poverty Ratio (HCR)	56.3	44.8	24.1	18.6	29.6
	Population Share	13.6	14.8	35.7	35.8	100.0
	Share of Poor	25.9	22.5	29.1	22.6	100.0
Urban	Poverty Ratio (HCR)	40.9	42.8	35.6	26.8	32.1
	Population Share	3.1	17.2	23.8	55.9	100.0
	Share of Poor	4.0	22.9	26.4	46.7	100.0

Note: ST, SC and OBC denote scheduled tribe, scheduled caste and other backward class respectively.
Source: Calculated from unit level data

Table 10 Incidence of Poverty across Regions in Maharashtra, 1993-94 and 2004-05

Region	Rural		Urban		Combined	
	1993-94	2004-05	1993-94	2004-05	1993-94	2004-05
Coastal	15.2	26.0	12.5	14.5	13.3	17.7
Inland Western	24.9	9.6	40.2	36.8	29.3	18.6
Inland Northern	47.3	37.9	58.5	48.2	50.3	41.0
Inland Central	49.8	42.6	61.5	66.2	52.4	47.9
Inland Eastern	49.1	33.5	59.0	46.9	52.6	38.2
Eastern	49.3	47.1	52.7	35.8	49.8	44.7
Maharashtra	37.9	29.6	35.2	32.1	36.9	30.6

Note: Coastal region comprises of all districts from Konkan division including Mumbai, Inland Western region comprises of all districts from Pune division and Ahmednagar district from Nashik division, Inland Northern region comprises of all districts from Nashik division except Ahmednagar, Inland Central region comprises all districts from Marathwada division, Inland Eastern comprises of all districts from Amravati division and Nagpur and Wardha districts from Nagpur division, Eastern region comprises of the remaining districts from Nagpur division.
Source: Calculated from unit level data.

Table 11 Population Share and Share of Poor Across Regions in Maharashtra, 2004-05

Region	Rural		Urban		Combined	
	Population Share, %	Share of Poor, %	Population Share, %	Share of Poor, %	Population Share, %	Share of Poor, %
Coastal	11.2	9.9	44.2	20.0	24.5	14.1
Inland Western	28.1	9.1	20.7	23.7	25.1	15.3
Inland Northern	13.7	17.5	8.8	13.3	11.7	15.7
Inland Central	22.1	31.9	9.5	19.5	17.0	26.6
Inland Eastern	17.3	19.5	13.8	20.2	15.9	19.8
Eastern	7.6	12.1	3.0	3.3	5.7	8.4
Maharashtra	100.0	100.0	100.0	100.0	100.0	100.0

Note: As in Table 10.
Source: Calculated from unit level data.

The poverty ratios in 2004-05 across NSS regions of Maharashtra are given in Table 10. Taking the rural and urban areas together, the proportion of poor at 18% was lowest in the Coastal region (Konkan division that includes Mumbai and its suburban areas) of Maharashtra. In rural areas independently, it is lowest in the Inland Western region (Pune division and Ahmednagar district of Nashik division). In rural areas, incidence of poverty is more than 40% in Eastern (Nagpur division after excluding Nagpur and Wardha districts), and Inland Central (Marathwada) and more than 30% in Inland Northern (Nashik division excluding Ahmednagar) and Inland Eastern (Amravati division and Nagpur and Wardha districts of Nagpur division). In urban areas, the incidence of poverty is the highest in Inland Central at 66%; it is more than 40% in Inland Northern and Inland Eastern, and more than 35% in Inland Western and Eastern regions. Comparing 1993-94 and 2004-05 estimates, one observes that there has been an increase in the incidence of poverty in both rural and urban areas of Coastal region and urban areas of Inland Central region. The highest decline in poverty was in the rural areas of Inland Eastern and Inland Western region at about 1.4 percentage points per annum and in the urban areas of Eastern and Inland Eastern regions of about 1.5 and 1.1 percentage points per annum respectively. However, the trends were not uniform during the entire period. The decline in Eastern and Inland Eastern region likely occurred during the first part and in the latter part there was likely a reversal. Other evidence, such as increasing farmers' suicides, point to a disturbing picture in rural areas.

Inequities in Education

Table 12 gives the trends in literacy rates. It shows that the literacy rate in Maharashtra has always been higher than the national average. Over the years, Maharashtra has reduced the gender gap to 19% in 2001, which is 2.5% lower than that of India (21.6%). The male literacy rate has reached nearly 86% and with this, one would expect the rate of literacy increase to decline. As expected, for the first time in 1991-2001, the percentage point increase in Maharashtra's literacy rate is lower then that of India. Does this mean that Maharashtra has a lower gender differential? Has its gender differential decreased over time? To assess this,

one makes use of a Gender Differential Indicator (GDI).[9] It shows that the differential has not only been increasing over time, but it has always been higher in Maharashtra when compared to India as a whole.

Table 12 Trends in Literacy Rate, Maharashtra and India, 1961-2001

Year	Maharashtra				India			
	Male	Female	Persons	GDI	Male	Female	Persons	GDI
1961	49.3	19.8	35.1	0.37	40.4	15.3	28.3	0.30
1971	59.4	31.0	45.8	0.41	46.0	22.0	34.5	0.31
1981	66.6	39.6	53.5	0.45	53.5	28.5	41.4	0.35
1991	76.7	52.4	64.9	0.51	64.1	39.3	52.2	0.41
2001	86.0	67.0	76.9	0.58	75.3	53.7	64.8	0.47

Note: GDI=Gender Differential Indicator=[1-(Illiteracy ratio of Males/Illiteracy ratio of Females)].
Source: http://www.indiastat.com (accessed 12 February 2007).

Region wise and sex wise literacy rates across social groups in 2001 are given in Table 13. To assess the gender differential across caste groups we again make use of GDI. Despite relatively lower gaps, it shows a higher gender differential in all areas in Maharashtra when compared with all India. Between regions, gender differentials are higher in urban areas. Across caste groups, the gender differential is higher among scheduled castes. Similarly, we have also computed a Regional Differential Indicator (RDI). While comparing Maharashtra with all India, it shows a relatively lower regional differential for males and all persons, but not for females. Across castes, the regional differential is higher for scheduled tribes but lower for scheduled castes. Within Maharashtra, scheduled tribes show a greater regional differential. Despite greater literacy rates in Maharashtra, the gender and regional differentials point to certain gaps in the nature and pace of attainments.

[9] Mishra (2008) discusses a measure to explain group-differential which is sensitive to levels in the sense that a given hiatus at a lower level of failure (greater attainment) is considered worse off. The measure used in this paper satisfies difference based level sensitivity in a strong sense and ratio based level sensitivity in a weak sense. The measure is also normalised to a 0-1 scale with zero indicating no differential and unity indicating maximum possible differential

Table 13 Region wise and Sex wise Literacy Rate Across Social Groups, Maharashtra and India, 2001

Caste	Region	Maharashtra				India			
		Male	Female	Persons	GDI	Male	Female	Persons	GDI
ST	Rural	64.52	39.88	52.31	0.41	57.39	32.44	45.02	0.37
	Urban	82.98	64.70	74.18	0.52	77.77	59.87	69.09	0.45
	Total	67.02	43.08	55.21	0.42	59.17	34.76	47.10	0.37
	RDI	0.52	0.41	0.46	NA	0.48	0.41	0.44	NA
SC	Rural	80.56	54.71	67.88	0.57	63.66	37.84	51.16	0.42
	Urban	87.58	68.41	78.27	0.61	77.93	57.49	68.12	0.48
	Total	83.29	59.98	71.90	0.58	66.64	41.90	54.69	0.43
	RDI	0.36	0.30	0.32	NA	0.39	0.32	0.35	NA
All	Rural	81.93	58.40	70.36	0.56	70.70	46.13	58.74	0.46
	Urban	91.03	79.09	85.48	0.57	86.27	72.86	79.92	0.49
	Total	85.97	67.03	76.88	0.58	75.26	53.67	64.84	0.47
	RDI	0.50	0.50	0.51	NA	0.53	0.50	0.51	NA

ST=scheduled tribe, SC=scheduled caste, RDI=Regional Differential Indicator=[1-(Illiteracy ratio in urban/Illiteracy ratio in rural)].GDI is as in Table 10.
Source: http://www.indiastat.com (accessed 12 February 2007).

Maharashtra's lower literacy attainments are further accentuated if one takes into consideration the average years of schooling (Table 14). It indicates that the literate among the rural scheduled tribe females have attended fewer years of schooling. Overall, females have lower years of schooling: other rural females fare worse than scheduled caste rural males.

Table 14 Average Year of Schooling (1999-2000), Maharashtra

Region	Sex	ST	SC	OBC	Other	Total
Rural	Male	3.2	4.3	5.0	5.6	4.9
	Female	1.7	2.5	3.1	3.5	2.9
	Persons	2.5	3.4	4.0	4.5	3.9
Urban	Male	6.7	5.8	6.6	7.7	7.2
	Female	4.8	4.3	5.0	6.4	5.8
	Persons	5.8	5.1	5.8	7.1	6.6
All		3.9	4.1	4.8	5.6	5.0

Note: ST=scheduled tribe, SC=scheduled caste, OBC=other backward class
Source: Paranjape (2007)

Paranjape (2007) makes use of an educational attainment classification system based on a 7-point scale. The population is classified into one of 7 categories of educational attainment:(1) illiterate, (2) literate but below primary, (3) primary, (4) middle, (5) secondary, (6) higher secondary and (7+) graduation and above. He

then calculates Gini coefficients to provide a measure of inequity (Table 15). This and other results in the paper are summarized as follows:

"(a) The distribution of education is extremely skewed, particularly in the rural regions and specially, among the socially backward sections. (b) The inequality in spread of education, as measured by Gini, is much higher among females than males in, both, rural and urban regions. (c) The caste-based inequality is sharper in rural areas. (d) Urban males show the least disparity, while rural females show the highest disparity in educational attainment. (e) Gini values are higher when average schooling levels are lower. Moreover, Gini falls when fall in illiteracy is supplemented by a rise in attainment of higher levels of education, particularly postsecondary."

Table 15 Education Gini Coefficients (1999-2000), Maharashtra

Region	Sex	ST	SC	OBC	Other	Total
Rural	Male	0.586	0.498	0.449	0.426	0.471
	Female	0.733	0.651	0.601	0.577	0.621
	Persons	0.660	0.577	0.527	0.504	0.548
Urban	Male	0.396	0.395	0.360	0.350	0.362
	Female	0.516	0.509	0.485	0.433	0.459
	Persons	0.454	0.451	0.418	0.388	0.407

Note: ST=scheduled tribe, SC=scheduled caste, OBC=other backward class.
Source: Paranjape (2007)

Human Development Index across Districts

The discourse on human development has identified issues beyond income. Prabhu and Kamdar (1999) point out that social expenditure has been biased towards urban areas and that regional as well as inter-personal inequality persist. Growth in income has not translated to growth in human development. More recently, Kamdar and Basak (2005) referred to a human development backlog that is not based on financial allocation but rather based on outcome or attainment indicators. Another recent exercise (Civil Society Report 2007) critically evaluates the attainments (or, rather, the shortfalls) of Maharashtra through the prism of the seven Millennium Development Goals (MDGs).

In the *Human Development Report Maharashtra 2002* the human development index (HDI) was calculated using dated information on per capita income and infant mortality. Kumar (2006) has calculated an updated HDI for 1999-2001 for districts of Maharashtra by using per capita income for 2000-01 (at constant 1993-94 prices), infant mortality rate for 2001 (calculated by Ram et al. 2005), literacy rate for 2001 and mean years of schooling for 1999-2000 (Table 16). These HDI values will not be comparable with that given in the *Human Development Report Maharashtra, 2002*. Nevertheless, it may be pointed out that because of changes in the value of indicators there are some ranking changes. The districts doing better then the state average HDI of 0.49 are largely the Konkan and Western Maharashtra and a few from Vidarbha (Nagpur, Wardha and Washim) and Ahmadnagar district from Nashik division. The remaining districts of Nashik and Vidarbha and all the districts of Marathwada division have a lower value of HDI than the state average. Mumbai has the highest HDI value whereas Gadchiroli has the lowest value. What is important to note is that there is wide disparity across districts in all the dimensions—education, health and income.

Table 16 Human Development Index (HDI) for Districts of Maharashtra, 1999-2001

Districts	Literacy, 2001	Mean Years of Schooling, 1999-2000	Per Capita Income (PCI), 2000-01 (1993-94 prices)	Infant Mortality Rate (IMR), 2001	Education Index	PCI Index	IMR Index	HDI Index, 1999-2001	HDI Rank, 1999-2001
Mumbai	86.8	5.9	30600	25	0.05	0.00	0.08	0.96	1
Satara	78.5	5.4	13036	22	0.27	0.74	0.02	0.66	2
Pune	80.8	5.7	19680	42	0.19	0.46	0.41	0.65	3
Sindhudurg	80.5	6.4	12349	29	0.14	0.77	0.16	0.65	4
Kolhapur	77.2	5.8	16169	32	0.26	0.61	0.22	0.64	5
Thane	81.0	5.5	17928	41	0.21	0.53	0.39	0.62	6
Ratnagiri	75.4	4.9	11148	21	0.39	0.82	0.00	0.60	7
Sangli	76.7	5.6	14534	35	0.29	0.68	0.27	0.59	8
Nagpur	84.2	6.3	16880	56	0.06	0.58	0.69	0.56	9
Wardha	80.5	6.3	11850	43	0.15	0.79	0.43	0.54	10
Raigadh	77.3	5.3	17180	50	0.31	0.56	0.57	0.52	11
Washim	74.0	5.4	10435	35	0.37	0.85	0.27	0.50	12
Solapur	71.5	4.2	11445	29	0.54	0.81	0.16	0.50	13
Ahmadnagar	75.8	4.6	10714	34	0.41	0.84	0.25	0.50	14
Amaravati	83.0	5.6	10867	50	0.16	0.83	0.57	0.48	15
Akola	81.8	5.4	9682	46	0.21	0.88	0.49	0.47	16
Bhandara	78.7	6.1	10234	48	0.20	0.86	0.53	0.47	17
Gondia	78.7	6.1	9279	48	0.20	0.90	0.53	0.46	18
Latur	72.3	5.3	8544	39	0.41	0.93	0.35	0.43	19
Jalgaon	76.1	5.1	11805	51	0.35	0.79	0.59	0.42	20
Nashik	75.1	4.2	13459	50	0.46	0.72	0.57	0.42	21
Chandrapur	73.1	3.8	12507	47	0.54	0.76	0.51	0.40	22
Dhule	72.1	5.6	9075	47	0.40	0.91	0.51	0.40	23
Hingoli	66.9	3.0	9474	32	0.75	0.89	0.22	0.38	24
Buldhana	76.1	4.3	8709	53	0.43	0.92	0.63	0.34	25
Jalna	64.5	2.9	9100	43	0.82	0.90	0.43	0.28	26
Bid	68.5	4.1	9159	55	0.61	0.90	0.67	0.27	27
Yamatmal	74.1	4.3	9671	63	0.48	0.88	0.82	0.27	28
Osmanabad	70.2	4.2	8537	57	0.56	0.93	0.71	0.27	29
Parbhani	67.0	3.0	9243	51	0.75	0.90	0.59	0.26	30
Aurangabad	73.6	4.2	11903	72	0.49	0.79	1.00	0.24	31
Nanded	68.5	3.5	8091	58	0.67	0.95	0.73	0.22	32
Nandurbar	56.1	3.8	7989	47	0.91	0.95	0.51	0.21	33
Gadchiroli	60.3	4.9	6829	59	0.72	1.00	0.75	0.18	34
Maharashtra	77.3	5.0	15070	48	0.34	0.65	0.53	0.49	-

Note: The HDI values will not be comparable with that given in the *Human Development Report Maharashtra, 2002* because at the indicator level the maximum and minimum used are from their respective observations under analysis (see education index, PCI index and IMR index above; in these indices 0 implies minimum failure whereas 1 implies maximum failure across districts) and not from a global maximum or minimum. The 2001 IMR estimates for Bhandara, Dhule, Nandurbar and Raigarh are not available. Approximate values are obtained by using 1991 estimates of the district (at times of undivided district) and its variation from the state average.

Source: Kumar (2006).

Agrarian Crisis and Farmers' Suicides

There is an agrarian crisis in India including the state of Maharashtra. There are two dimensions to this. On the one hand, it points out the livelihood crisis for the large mass of small and marginal farmers as also agricultural labourers dependent on it. On the other hand, there is an agricultural developmental crisis (Reddy and Mishra 2009). Thus, farmers and farms are being excluded. In development discourse, the former can be identified with displacement of people and the latter with displacement of ideologies (Bhaduri 2008).

Agriculture's contribution to Maharashtra's gross state domestic product (GSDP) in current prices has reduced from 18% in 1993-94 to 12% in 2006-07. Despite agriculture constituting only 12% of the GSDP, the 2001 census showed that 55% of Maharashtra's total workers are employed in this sector, as either cultivators or agricultural labourers. Sectoral growth rates during the pre-reform (1980 to 1993) and post-reform (1994 to 2005) periods show deceleration for industry and agriculture. The growth rate for agriculture of 0.8% per annum in the post-reform period was not statistically significant (Table 17). What is more, the gross value of output for agriculture proper has reduced by Rs.1660 million at constant 1993-94 prices between triennium ending (TE) 1995-96 and TE 2004-05 (Table 18). The reduction is evident for cereals, oilseeds excluding soybean, sugarcane and cotton. In the same period, the value of inputs increased by Rs.8060 million and the increase was statistically significant at 1.2% per annum.

Table 17 Sectoral Linear Trend Growth Rates in Maharashtra during 1980s and 1990s

Sector	1980-81 to 1992-93 (1980-81 prices)		1993-94 to 2004-05 (1993-94 prices)	
Agriculture	3.5	*	0.8	
Industry	6.2	*	3.4	*
Services	7.4	*	7.5	*
Total GSDP	6.1	*	5.2	*

Note: GSDP indicates Gross State Domestic Product. * indicates that the linear trend growth rate is significantly different from zero at 95% confidence interval.
Source: Mishra (2009).

The gross neglect of agriculture by the state in the 1990s is reflected in the drastic decline of capital expenditure on agriculture and allied activities (Chand 2009, Mishra 2009). The impact of the revival in recent years (tenth plan) as a response to the crisis can only be gauged with a time lag of four to five years. The backlog in regional imbalances, first calculated by the Dandekar committee (Government of Maharashtra 1984), seems to have increased and the expenditure on irrigation during 2002-03 to 2004-05 indicates a shortfall from the outlay in Vidarbha (Rs.25.280 billion) and Marathwada (Rs.11.480 billion) (Government of India 2006).

Table 18 Incremental Change in Value of Output for Agriculture Proper and Agricultural Inputs (TE 2004-05 over TE 1995-96)

Items	Incremental change, rupees crore	Index in TE 2004-05, if TE 1995-96=100	Linear trend growth rate (percent per annum)	
Value of Output (Agriculture, proper)	-166.3	99.2	0.3	
Cereals	-963.7	76.7	-2.8	*
Pulses	102.9	106.3	1.5	*
Soyabean (oilseed)	1042.9	310.8	12.6	*
Other oilseeds	-651.8	56.8	-6.6	*
Sugarcane	-607.9	79.0	-1.0	
Fibres (mostly Cotton)	-710.7	62.1	-4.9	*
Fruits and Vegetables	1577.3	131.3	3.6	*
Others	44.8	101.9	0.1	
Inputs	805.5	115.0	1.2	*
Seed	45.9	113.0	1.4	*
Chemical Fertilizers	271.9	122.8	2.6	*
Organic Manure	76.9	182.2	5.0	
Operation & Maintenance	379.4	382.2	13.7	*
Feed of Livestock	-86.2	96.5	-0.5	*
Irrigation Charges	1.5	103.6	0.0	
Market Charges	-0.4	99.9	0.4	
Electricity	-68.7	87.7	-4.4	*
Pesticides & Insecticides	25.3	148.9	3.9	*
Diesel Oil	160.0	170.6	6.1	*

Note: Linear trend growth rate is 'b' in ln (Yt)=a+bt+et where Y is the gross value of output/input and t is time and * indicates that b≠0 is statistically significant at 95% CI.
Source: State Income of Maharashtra (soft copy), Directorate of Economics and Statistics, Government of Maharashtra, 2006.

The cropping patterns of the major crop groups indicate a decline in the share of area used to grow cereals. What is much more worrying is the decline in gross cropped area from 19.5 million hectares in TE 1992-93 to 18.6 million hectares in TE 2004-05 (Table 19). Analysis of the difference between farmer income and farmer expenditure for different size-class of farmers in 2002-03 indicate that income falls short of expenditure for the near landless, the marginal (both lower and upper) and small farmers (Figure 2). The semi-medium farmer is a slightly above whereas the medium farmer and larger farmer have a net monthly

income of Rs.2,367 and Rs.8,412, respectively. These income levels make them relatively well off among the farmer households but do not indicate that India is shining. In any case, medium and large farmers constitute only about 10% of farmer households (Table 20).

In 2007, the government announced a debt waiver, which released....from debt up to ..... Prior to the waiver, nearly 55% of farmer households are indebted, and debt level increases with size class of holdings. The average outstanding amount of debt, even after normalizing by the number of indebted households, increases in proportion to the amount of land owned. This relationship between more land and more debt can be explained to a large extent by the fact that four-fifths of the debt has been accrued for productive purposes. This debt also has been increasing with size-class of farmer households. What is of especial concern is the lower proportion of debt for productive purposes held by the near landless and lower marginal groups. This debt is of concern because the two groups have a relatively higher share of debt for consumption (nearly 25% for the near landless), marriage, health and other (nearly 33% for the lower marginal). If one excludes the near landless, debt from institutional sources is around 80% for marginal, small and semi-medium farmers and around 90% for the medium and large farmers. A substantial amount of this debt (nearly half of the total debt at the aggregate level) is from cooperatives.

Table 19 Cropping Pattern in Maharashtra, TE 1992-93 and TE 2004-05

Crop	TE 1992-93	TE 2004-05
Cereals	54.3	48.5
Pulses	16.6	18.6
Oilseeds	13.0	15.4
Soyabean	1.4	8.9
Sugarcane	2.2	2.4
Cotton	13.8	15.1
Total area, (%)	100.0	100.0
Total area, Lakh hectares	194.7	185.6

Source: Office of the Commissioner Agriculture (1999, and personal communication)

Figure 2 Income and Expenditure by Size-class of Farmers in Maharasthra, 2002-03

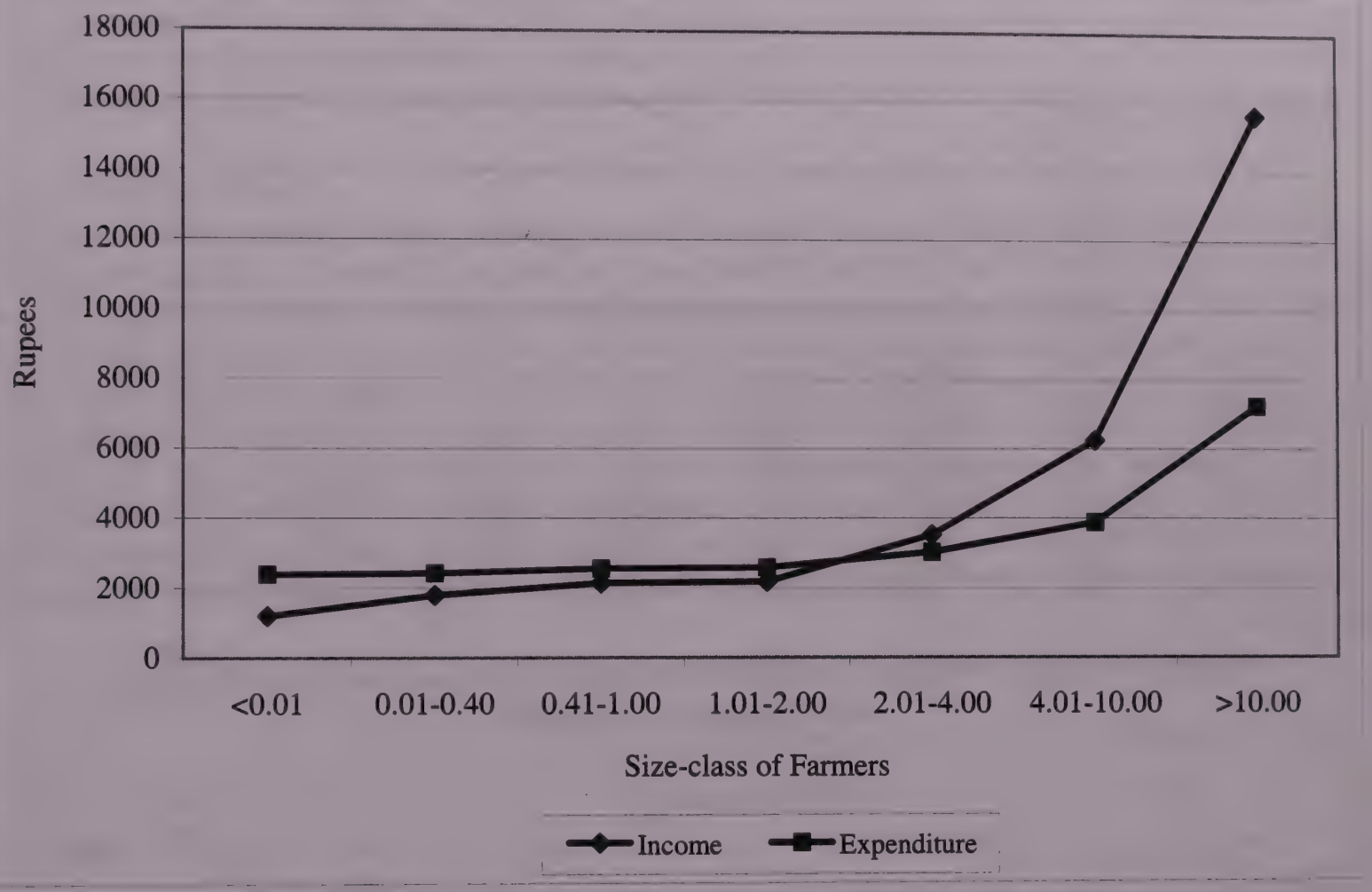


Table 20 Indebtedness of Farmers in Maharashtra, 2003

Size-class, Ha	Distri-bution of HHs, (%)	Indebted HHs, (%)	Outstanding Amount		Debt for Productive purposes, (%)	Debt from Institu-tional sources, (%)
			per HH, Rs	per indebted HH, Rs		
<0.01	1.1	35.7	8374	23479	41.1	58.3
0.01-0.40	15.2	40.3	6848	16992	36.4	83.2
0.41-1.00	27.8	47.6	8914	18717	71.5	80.2
1.01-2.00	26.0	55.1	15890	28861	73.2	78.8
2.01-4.00	19.2	66.7	18901	28352	88.1	83.8
4.01-10.00	9.2	72.5	40038	55226	92.0	88.7
>10.00	1.5	85.8	125913	146678	94.9	91.1
All	100.0	54.8	16973	30947	80.2	83.8

Note: Ha denotes hectares (Near Landless: <0.01, Lower Marginal: 0.01-0.40, Upper Marginal: 0.41-1.00, Small: 1.01-2.00, Semi-Medium: 2.01-4.00, Medium: 4.01-10.00, and Large: >10) and HHs denotes households.

Source: Situation Assessment Survey of Farmers, Indebtedness of Farmers Households, NSS 59th Round (January-December 2003), Report No.498(59/33/1), National Sample Survey Organisation, Government of India, May 2005.

In 2001, Maharashtra constituted about 9.3% of the all India cultivator population but accounted for 19.1% of the total farmer suicide deaths in the country during 1995-2006. The total number of farmer suicides in Maharashtra increased from 1083 in 1995 to a peak of 4453 in 2006 and then declining to 4238 in 2007. In particular, between 1995 and 2007, there was a 306% increase in male farmer suicides from 978 to 3968. During 1995-2007, male farmer suicides as a proportion of total male suicides in Maharashtra increased from 14% to 38%. Suicide mortality rate (SMR, suicide deaths for 100,000 persons) for male farmers more than quadrupled from 14.7 in 1995 to 60.7 in 2007 whereas SMR for male non-farmers decreased from 18.0 in 1995 to 14.1 in 2007 (Figure 3).

During 2001-04, SMR for farmers across divisions indicate relatively higher suicide deaths than the state average for males in Amravati and Nagpur divisions and for females in Amravati, Aurangabad and Nashik divisions (Figure 4). The ratio of farmers-to-age-adjusted SMR is highest in Amravati among males and in Nashik among females. Nagpur has a higher SMR for farmers, which is lower only than Amravati, but the ratio of farmers to age-adjusted SMR is much lower. These measures indicate that in a relative sense the SMR in Nagpur is also high across other sub-groups of population. The districts with SMR for male farmers that is higher than the state average are Akola (77), Amravati (144), Aurangabad (74), Beed (64), Buldhana (191), Chandrapur (89), Hingoli (51), Jalgaon (89), Nagpur (86), Nanded (56), Prabhani (68), Satara (53), Wardha (78) and Yavatmal (93). The large number of districts with above average SMR means that the situation is much more widespread than what has been accepted under policy interventions in Maharashtra.

Figure 3 Suicide Mortality Rate (SMR) for Males (Farmers and Non-Farmers) in Maharashtra, 1995-2006

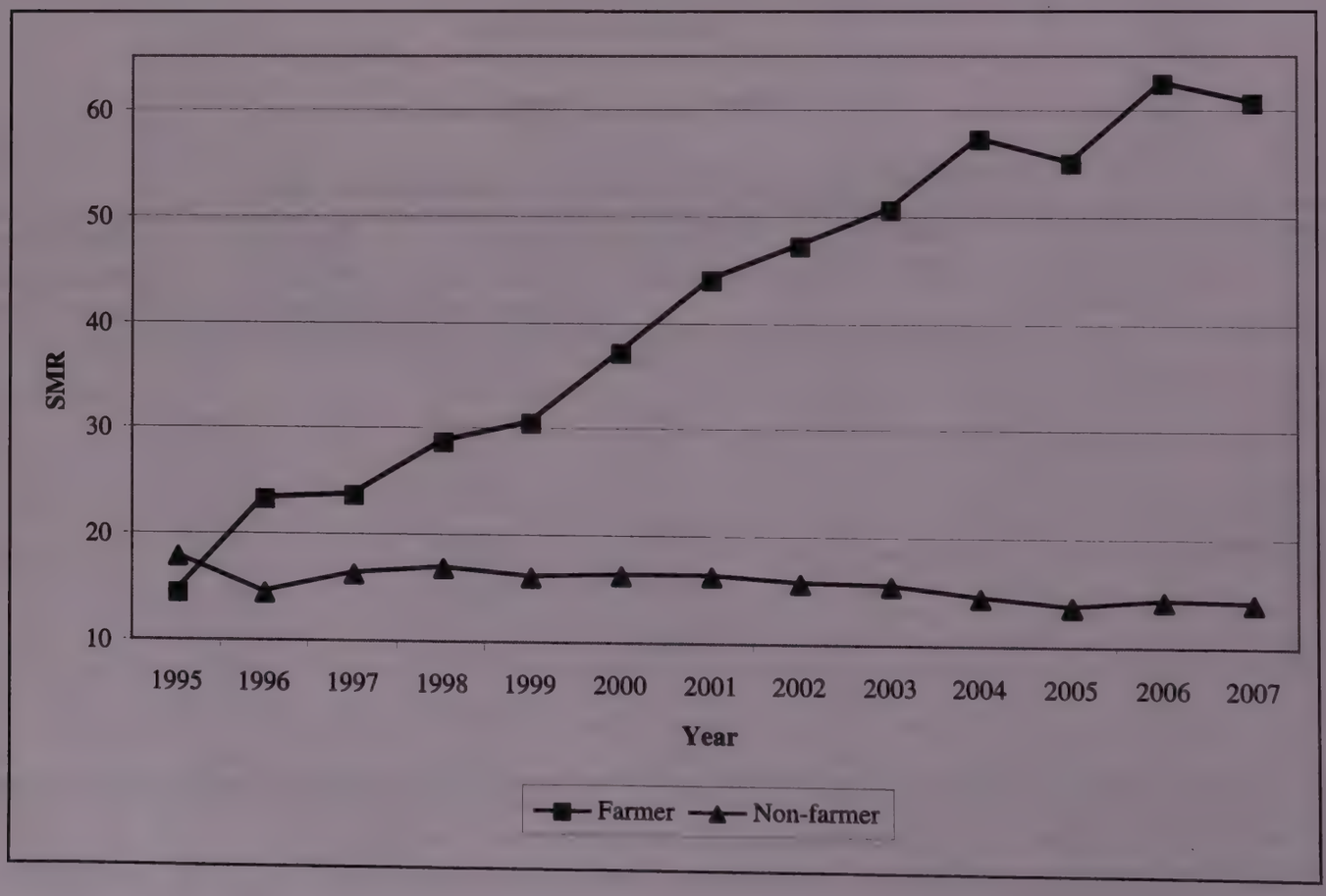
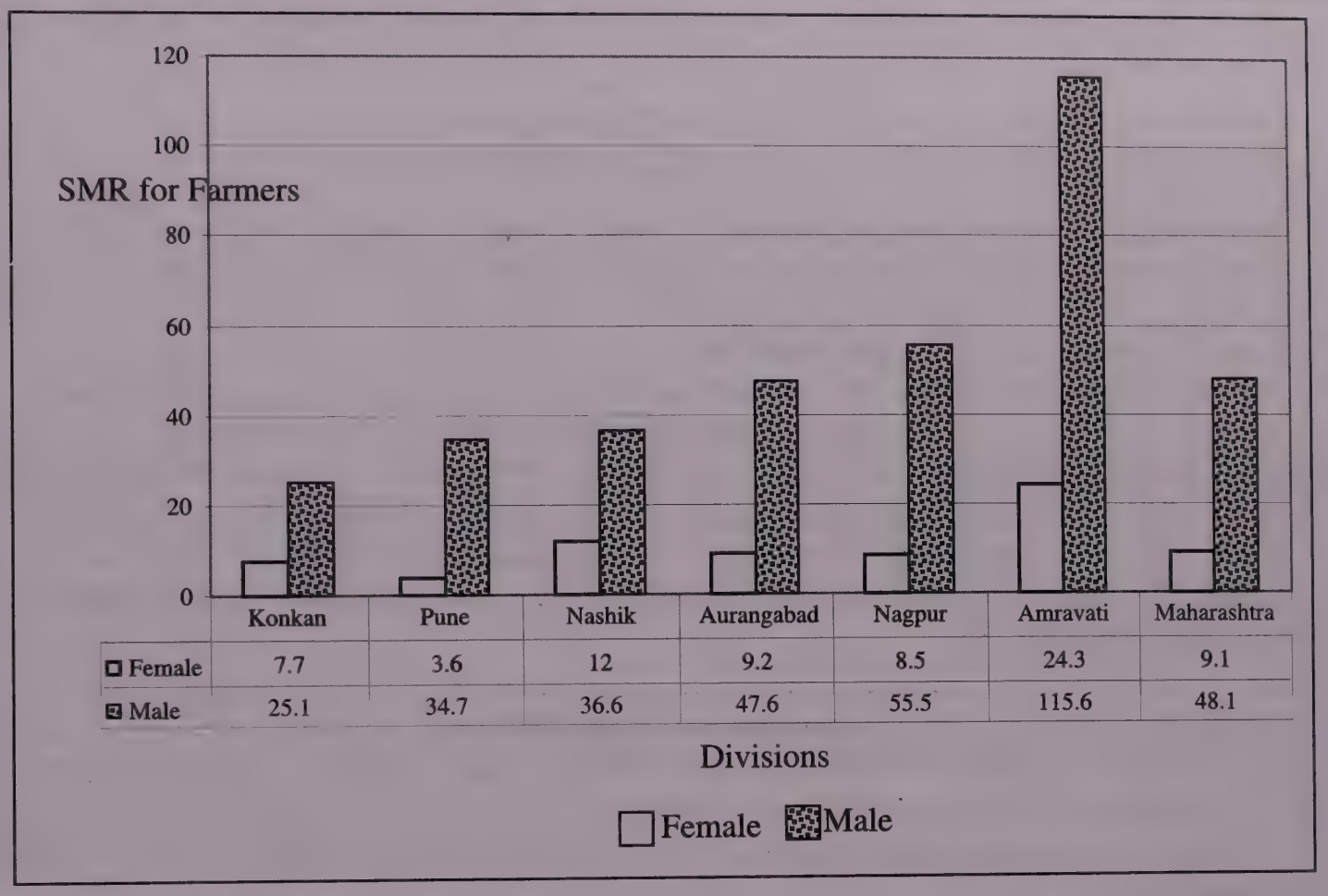


Figure 4 Suicide Mortality Rate (SMR) for Farmers across Divisions in Maharashtra, 2001-04



Suicide is a complex and multifaceted phenomenon. The associated factors can be identified in the neurobiological or the socio-economic domain. The former are predisposing whereas the latter are the precipitating ones. Relatively larger suicides among farmers points to an agrarian crisis although the absence of a high suicide rate does not necessarily indicate the absence of a crisis. The reasons for the agrarian crisis can be classified as systemic and idiosyncratic factors. Predominant among the systemic factors are declining public investment, inadequate availability of credit from formal sources, failure of research and extension, poor returns from cultivation, increasing cost of inputs, and increasing volatility of output prices due to linkages with the global market among others. At the idiosyncratic level, some of the coexisting and interrelated factors identified are greater credit burden, economic and social downfall, crop failure and difficulty in providing for social responsibility (daughter's marriage, ward's education or health care needs of family members) among others. A comparison of suicide cases with non-suicide control households in Vidarbha points to an increased likelihood of suicide in those with greater credit burdens even after normalizing by family size and land size, the absence of bullocks (a productive and liquid assets), greater number of family members (particularly more daughters) and lower value of produce, among other factors (Mishra 2006). In short, the farmer is faced with a multitude of risks: weather, credit, market (input and output), technology and social responsibility among others. In the absence of appropriate risk mitigation strategies, these risks make the farmer vulnerable. One of the outcomes of these unmitigated risks is the increasing incidence of farmers' suicides. If not adequately addressed, these high suicide rates are likely to further increase.

Farmers' suicides also have implications from a public health perspective. First, public health facilities must be adept at dealing with poisoning, a major method of committing suicide among farmers in Maharashtra. Second, adequate provisions must be made for mental health care, as preventive aspect. Third, the inability of the farmer to meet certain health care expenditure from their normal sources of income is a matter of concern. These shortcomings call for some public provisioning. These, however, will in no way address the agrarian crisis per se.

Maharashtra Employment Guarantee Scheme (MEGS)

In 1965, a pilot project was initiated in Tasgaon of Sangli District as part of Integrated Area Development Scheme. The enthusiastic public response led to a modified pilot project being implemented in 11 districts. It was extended to all rural areas of the state in 1972. It received statutory support through the Maharashtra Employment Guarantee Act 1977 that came into force on 29 January 1979. As per the Act, any adult member with no earning member in the household would get employment of unskilled nature within 15 days of seeking work or else the state has to pay compensation. No individual has ever received compensation under this scheme though they could not get employment in stipulated time period. What is more, there have been instances of people being denied their legitimate wages for work rendered (Panda and Mishra 2005). The National Rural Employment Guarantee Act (NREGA), 2005, which was first implemented in 200 districts on 2 February 2006 and has now been extended to all rural areas since 2008, is in a sense modelled after MEGS.

Implemtation of NREGA

The National Rural Employment Guarantee Act, (NREGA) was notified on September 7, 2005. The objective of the Act is to enhance livelihood security in rural areas by providing at least 100 days of guaranteed wage employment in a financial year to every household whose adult members volunteer to do unskilled manual work.

Discussions with the villagers regarding implementation of NREGS in *Thane district* revealed that though according to Scheme, the beneficiaries are supposed to either get work for 100 days in a year or an unemployment allowance; in reality, the villagers neither get enough work nor the unemployment allowance.

One of the registered labourers in the village told that in last one year he got work for just 27 days. He has still not received the wages for the work of last eight days which was done two months back.

In the NREGS, every person registered under the scheme should get a minimum of Rs. 60 per day. Currently, people in the village get only Rs. 50 per day.

By rule, all the documents and records related to the scheme should be available for public scrutiny. But the registers of the information about the workers, hours of work and payment is not maintained. Therefore there is no transparency in the system.

At the place of work, the workers are supposed to get drinking water facility and crèche for their children. If the workers get their own tools/instruments for work, they are supposed to get Re. 1 per day. However no such facility was available to the workers in this village.

The MEGS has largely been successful as a relief measure in the drought prone areas of Western Maharashtra (includes Ahmednagar) and Marathwada (NSS Inland Western and Inland Central regions respectively). The introduction of horticulture schemes (mostly in Coastal region) in individual household farms under MEGS has been successful from a productivity point of view as well (Vatsa 2005). This is corroborated by the fact that the share of MEGS expenditure during 2000-01 to 2003-04 is much greater than their share of rural poor in these three regions (Table 21). The Inland Northern region (Nashik division after excluding Ahmednagar district), Inland Eastern region (Amravati division and Nagpur and Wardha districts of Nagpur division), and Eastern region (remaining districts of Nagpur division) share of expenditure (31%) is much lower than their share of poor (56%) or share of population (40%). This is indicative of the failure of public administration, political leadership and civil society (Mishra and Panda 2006).

Table 21 Share of Rural Population, Rural Poor and MEGS Expenditure Across NSS Regions of Maharashtra

Year/Item	Inland Western	Inland Central	Coastal	Inland Northern	Inland Eastern	Eastern	Maharashtra*	
Rural population, 2001	28.3	21.1	11.1	14.4	17.3	7.8	100.0	(5.6)
Rural poor, 1999-2000	13.7	21.3	8.8	18.8	23.2	14.2	100.0	(1.3)
Total MEGS Expenditure#	21.1	37.5	10.0	10.6	10.4	10.5	100.0	(3338.0)

Note: * Figures in parentheses indicate total in crore. For expenditure under MEGS it excludes the miscellaneous amount. # For the period 2000-01 to 2003-04.
Source: Mishra and Panda (2006).

In a recent study with 80% of the sample from below poverty line households, Panda and Mishra (2005) observe that 42% of the poor households were faced with a situation where all family members did not get two square meals a day at some time or the other during the year. Adjusting for the greater representation of poor in the sample, one may state that roughly six to eight percent of rural households face food shortages at some time or the other during the year. Even though the sample is not representative, this is quite serious and much higher than the 2004-05 National Sample Survey estimates that only 1% of households do not get enough food in some months of the year; while looking into sub-groups, one observes that it is higher in rural areas for scheduled tribes at 4.3% and Antodaya card holders at 4.7% and in urban areas for scheduled castes at 1.7% and below poverty line card holders at 2.4% (NSSO 2007). Across seasons, vulnerability was higher during the monsoon months. Many of the food insecure households resorted to migration to make both ends meet. This also effected their utilisation of benefits from public facilities like Anganwadi and schools that existed in their villages. One also observed non-payment of wages under MEGS and other public works and denial of food subsidies by not providing appropriate ration cards.

Panda and Mishra (2005) also highlight the successful intervention through integration of various schemes including MEGS by Bharatiya Agro Industries Foundation (BAIF), a non-governmental organization (NGO) that operates in tribal regions of India. One of their major interventions in some villages of Jawhar is through development of Wadis, which literally translated means orchard. To begin with, self-help groups are formed with six to eight beneficiaries, each having two to three acres of land adjacent to each other. In the initial years the beneficiaries worked on (a) their own plots leading to land development and planting of

horticultural crops like cashew, guava and lemon and (b) construction of a water harvesting structure on a nearby stream. The formation of self-help groups might come under Swarnajayanti Gram Swarozgar Yojana (SGSY), wages for their labour are paid from MEGS or other employment schemes for three years – the time required for trees to bear fruit, non-wage expenses for land development, water harvesting structure and sapling of fruit bearing trees could be from MEGS or other government schemes. BAIF has also helped them organize and sell their produce in the market. These interventions stopped seasonal migration, improved enrolment, retention and attendance of school going children, increased nutritional intake through consumption of fruits grown in their own land, and more than doubled annual household incomes. BAIF's intervention has also helped landless households to take up livestock rearing or other activities.

Concluding Remarks

The state of Maharashtra is among the richest across states, but has not been as successful in reducing poverty, which has consistently remained around the national average. Agriculture is not the state's forte, as it is in Punjab or Haryana, and its share in the gross state domestic product has reduced to around 12%. However, more than half the state's workforce is still dependent on agriculture. What is intriguing is that in constant 1993-94 prices the value of output from agriculture dropped from TE 1995-96 to TE 2004-05. Returns from cultivation are abysmally low. There seems to be a large agrarian crisis. Increasing incidence of farmers' suicides and agricultural indebtedness are only symptoms of this crisis. The per capita income of Washim in 2006-07 is less than one-third that of Mumbai. Comparable estimate of recent years (1999-2000 to 2004-05) indicate that the decline of rural poverty in Maharashtra is less than 0.2 percentage points per annum.

In 2004-05, Marathwada, Nashik and Vidarbha divisions had a greater share of poor people than their population share. Across caste groups, the scheduled tribes and scheduled castes have a greater share of poor when compared to their population shares. The popular Maharashtra Employment Guarantee Scheme (MEGS), on which the National Rural Employment Guarantee Act of 2005 was modelled, seems to have been largely successful as a relief measure in drought prone areas and not as a poverty alleviation programme. Literacy and other educational attainment bring out gender, caste and rural-urban differences; for instance, the rural tribal female literacy rate of 40% is less than half that of the overall urban male literacy rate of 91%. These tribe and caste based differences become more and more accentuated when one looks at average years of schooling or educational attainment. The updated Human Development Index (HDI) reiterates the regional divide, but independent indicators convey the point that a district with relatively better income may not do as well in other indicators. For instance, Nagpur, which has a high income and literacy rate does not fare well in lowering IMR. Similarly, a district not doing well in income may fare better in other indicators. For example, Akola, Amravati and Wardha do well in educational attainment despite low per capita incomes. Overall there are striking differences across regions, social groups or gender in the indicators of income, poverty and educational attainment among others.

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Chapter 3

Calorie Deprivation in Maharashtra: Analysis of NSS Data

Chapter 3

Calorie Deprivation in Maharashtra: Analysis of NSS Data[1]

Srijit Mishra and Lakshmikanth Hari[2]

Abstract:

This paper explores calorie deprivation in Maharashtra across regions as well as sub-groups of population such as caste, size-class of land possessed, religion, and household type (indicating principal occupation of the household) for rural and urban areas separately. There are two aspects to the discussion. First, we explore the inequities with regard to average intake in terms of calorie, fat, protein and cereals. Second, we analyse incidence, depth and severity of calorie deficiency. In the latter calculation, we use per consumer unit calorie norm of 2400 in rural and 2100 in urban and arrive at incidences of calorie-poor to be 54% in rural and 40% in urban. This will be lower than a per capita calorie norm with the same bench mark, but is higher than the incidences of expenditure-poor of 30% for rural areas and 32% for urban areas. It is worrying that the hands that help produce food (farmers and agricultural labourers) have a higher incidence of calorie poor.

Key words: Calorie deficiency; Depth, Incidence, Severity, and Sub-group differences

JEL Codes: D30, I32, O15

Introduction

Calorie deprivation has implications for poverty. It is for this that the poverty line calculated on the basis of consumption expenditure in 1973-74 was pegged by taking a per capita minimum of 2400 calorie in rural and 2100 calorie in urban India. In subsequent updating of the poverty line, the calorie equivalence has not been maintained. An enquiry into calorie deprivations based on consumption patterns would throw some insights. Section 2 discusses some broad trends based on the available secondary data, particularly by making use of National Sample Survey Organisation (NSSO) reports for 1993-94, 1999-2000 and 2004-05 (NSSO 1996, 2001 and 2007). Based on unit level data analysis for 2004-05 (Schedule 1.0, National Sample Survey (NSS) 61st round) across various sub-groups of population (NSS region, social group (caste), size-class of land possessed (in rural only), religion, household type (occupation)) per consumer unit, section 3 discusses some patterns emphasizing on average consumption in terms of calorie, protein, fat and cereals and share of calorie consumption across various food groups, and section 4 looks into the incidence, depth and severity of calorie-deficiency.

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Calorie, Protein and Fat Consumption: Some Broad Trends

Trends in per capita per day calorie, protein and fat consumption in rural and urban regions of Maharashtra and India are indicated in Table 1. After excluding 1999-2000 from the analysis, as the recall period for this survey is not comparable, one observes the following. In rural and urban Maharashtra there was increase in calorie, fat and protein consumption from 1972-73 to 1983. Between 1983 and 2004-05, calorie consumption declined by about 9-10% from 2144 to 1933 in rural areas and from 2028 to 1847 in urban areas and protein consumption declined from 62 grams to 56 grams in rural areas and from 56 grams to 52 grams in urban areas. Fat consumption, on the other hand has been increasing throughout, and in 2004-05 stands at 42 grams in rural areas and 50 grams in urban areas. Between 1972-73 and 2004-05, the all India scenario indicates that calorie consumption declined (by 10% from 2266 to 2047 in rural areas and by 4% from 2107 to 2020 in urban areas), protein consumption declined from 62 grams to 57 grams in rural areas and remained around 57 grams in urban areas, and fat consumption increased (from 24 grams to 36 grams in rural areas and from 36 grams to 48 grams in urban areas).

Table 1 Trends in Per Capita Per Day Calorie, Protein and Fat Consumption in Rural and Urban regions of Maharashtra and India, 1972-73 to 2004-05

State	Region	Item	1972-73	1983	1993-94	1999-2000	2004-05
Maharashtra	Rural	Calorie	1895.0	2144.0	1939.0	2012.0	1933.0
		Protein	54.0	62.0	54.8	56.5	55.7
		Fat	24.0	30.0	33.5	39.7	41.5
	Urban	Calorie	1971.0	2028.0	1989.0	2039.0	1847.0
		Protein	55.0	56.0	55.5	55.9	52.1
		Fat	41.0	45.0	47.9	52.6	50.1
India	Rural	Calorie	2266.0	2211.0	2153.0	2149.0	2047.0
		Protein	62.0	62.0	60.2	59.1	57.0
		Fat	24.0	27.0	31.4	36.1	35.5
	Urban	Calorie	2107.0	2089.0	2071.0	2156.0	2020.0
		Protein	56.0	57.0	57.2	58.5	57.0
		Fat	36.0	37.0	42.0	49.6	47.5

Note: Comparison over time has its limitations, more so, for 1999-2000 where the reference period for collecting consumption data was seven days compared to 30 days in the other rounds.
Source: NSSO (2007)

Consumer units, developed by (Gopalan et al.1989) and presented in Table 2, are equivalence scales assigned to a person based on the varying nutritional requirement based on age and sex. The consumer unit peaks at 10-12 years and then shows a decline for females but shows a second but lower peak for males at 16-19 years. The consumer unit would be higher for pregnant women, but National Sample Survey (NSS) quinquennial rounds on consumption expenditure do not collect information on the pregnancy status of women. Further, as the demographic structure and occupational pattern of India alters, consumption requirements will also shift, but these also cannot be addressed in the current exercise.

Table 2 Number of Consumer Units Assigned to a Person

Age	Male	Female
< 1	0.43	0.43
1-3	0.54	0.54
4-6	0.72	0.72
7-9	0.87	0.87
10-12	1.03	0.93
13-15	0.97	0.80
16-19	1.02	0.75
20-39	1.00	0.71
40-49	0.95	0.68
50-59	0.90	0.64
60-69	0.80	0.51
70+	0.70	0.50

Source: Gopalan et al (1989)

Trends in consumer unit, that is, after adjusting for age and sex distribution, indicate the following patterns (Table 3). The average consumer unit, as expected, is higher than that for per capita; a caveat while using the latter is that deprivation can get overestimated. Calorie and protein consumption in 2004-05 is lower than both 1999-2000 and 1993-94 for rural and urban regions of Maharashtra and India. Fat consumption in 2004-05 is greater than that of 1993-94 for rural and urban areas of Maharashtra and India.

Table 3 Trends in Per Consumer Unit Per Day Calorie, Protein and Fat Consumption in Rural and Urban regions of Maharashtra and India, 1993-94 to 2004-05.

Region	Item	Maharashtra			India		
		1993-94	1999-2000	2004-05	1993-94	1999-2000	2004-05
Rural	Calorie	2427	2500	2405	2683	2668	2540
	Protein	68.6	70.2	69.3	75.0	73.4	70.8
	Fat	41.9	49.3	51.6	39.1	44.9	44.0
Urban	Calorie	2432	2484	2261	2542	2637	2475
	Protein	67.9	68.1	63.8	70.2	71.5	69.9
	Fat	58.6	64.1	61.3	51.6	60.7	58.2

Note: As in Table 1.
Source: NSSO (1996, 2001 and 2007)

Share of calorie consumption per consumer unit across food groups given in Table 4 indicates the following. In rural Maharashtra, there was decline in the share of cereals by 5.3% points, sugar and honey by 0.4% points, and roots and fibre by 0.04% points (not shown in the table); the increases were in oils and fats by 3.1% points, miscellaneous items by 1.8% points, milk and milk products by 0.5% points, pulses, nuts

and oilseeds, and vegetables and fruits by 0.2% points each. In urban Maharashtra there was a decline in unit consumption of cereals by 19.4% points and roots and fibre by 0.6% points. There were increases in unit consumption of oils and fats by 8.3% points, miscellaneous items by 3.3% points, pulses, nuts and oilseeds by 3.2% points, sugar and honey by 2% points, milk and milk products by 1.8% points, vegetables and fruits by 1.2% point and meat, egg and fish by 0.3% points.

In contrast to rural Maharashtra, rural India saw an increase in the share of cereals by 14% points and that of roots and fibre by more than 1% points; and there was decline in the shares of oils and fats by 3.7% points, miscellaneous items by 3.2% points, pulses, nuts and oilseeds by 2.7% points, sugar and honey by 2.5% points, milk and milk products by 1.6% points, vegetables and fruits by 1% points, and meat, egg and fish by 0.3% points. In urban India, there has been decline in shares of cereals by 2.4% points, sugar and honey by 0.5% points, miscellaneous items by 0.3% points, and vegetables and fruits by 0.1% points; and there has been increase in the shares of oils and fats by 1.8% points, pulses, nuts and oilseeds, and milk and milk products by 0.6% points each, roots and fibre by 0.3% points and meat, egg and fish by 0.1% points.

It is true that when the diet of rural India became increasingly cereal-centric that of rural Maharashtra diversified, but largely towards oil and fats and miscellaneous items. Urban India is diversifying its food basket at a greater degree than is urban Maharashtra. What is more, with lower calorie intake (see Table 3) Maharashtra seems to have greater shares of oils and fats, pulses, nuts and oilseeds, sugar and honey, and miscellaneous items.

Table 4 Share of Calorie Consumption Per Consumer Unit across Food groups for Rural and Urban Regions in Maharashtra and India, 1993-94 and 2004-05

State	Region	Year	Cereals	Roots & Fibre	Sugar & honey	Pulses nuts & oilseeds	Vegetables & Fruits	Meat Egg & Fish	Milk & milk products	Oils & Fats	Miscellaneous	All
Maharashtra	Rural	1993-94	66.8	1.7	7.4	7.6	1.9	0.7	4.3	7.2	2.5	100.0
		2004-05	61.5	1.7	7.0	7.8	2.1	0.7	4.8	10.3	4.3	100.0
	Urban	1993-94	71.0	2.7	4.8	4.9	2.0	0.7	6.2	5.3	2.4	100.0
		2004-05	51.6	2.1	6.8	8.1	3.2	1.0	8.0	13.6	5.7	100.0
India	Rural	1993-94	53.5	1.9	7.3	7.7	3.2	1.1	8.0	11.1	6.2	100.0
		2004-05	67.5	3.0	4.8	5.0	2.2	0.8	6.4	7.4	3.0	100.0
	Urban	1993-94	58.5	2.5	6.2	6.1	3.3	1.0	8.0	8.8	5.6	100.0
		2004-05	56.1	2.8	5.7	6.7	3.2	1.1	8.6	10.6	5.3	100.0

Note: As in Table 1.
Source: NSSO (1996 and 2007).

As in calorie intake, protein consumption is also lower in both rural and urban areas of Maharashtra when compared with all India (Table 3). Share of protein consumption per consumer unit across food groups given in Table 5 indicates the following. Compared to India, in rural and urban areas of Maharashtra the

share of cereals, milk and milk products, and meat, egg and fish are lower whereas that of pulses and others are higher in 2004-05. Between 1993-94 and 2004-05, in rural Maharashtra there was decline in the share of cereals by 5.2% points, pulses by 1% point, and meat, egg and fish by 0.3% points, and there was increase in the share of others by 5.9% points and that of milk and milk products by 0.6% points. In urban areas there was decline in the share of cereals by 2.5% points and meat, egg and fish by 0.8% points whereas there was increase in the share of others by 2.6% points and that for pulses by 0.5% points. The share of milk and milk products remained the same.

Table 5 Share of Protein Consumption Per Consumer Unit across Selected Food groups for Rural and Urban Regions in Maharashtra and India, 1993-94 and 2004-05

Region	Year	Maharashtra						India					
		Cereals	Pulses	Milk & milk products	Meat Egg & Fish	Others	All	Cereals	Pulses	Milk & milk products	Meat Egg & Fish	Others	All
Rural	1993-94	68.0	12.9	6.1	3.8	9.2	100.0	69.4	9.8	8.8	3.7	8.3	100.0
	2004-05	62.8	11.9	6.7	3.5	15.1	100.0	66.4	9.5	9.3	4.0	10.8	100.0
Urban	1993-94	56.7	12.7	11.5	6.0	13.2	100.0	59.4	11.5	11.7	5.3	12.1	100.0
	2004-05	54.2	13.2	11.5	5.2	15.8	100.0	56.2	11.0	12.3	5.5	15.0	100.0

Note: As in Table 1.
Source: NSSO (1996 and 2007).

Table 6 Calorie, Protein and Fat Consumption per Consumer Unit by Decile Class in Rural and Urban Maharashtra, 1993-94 and 2004-05

Item	Region	Year	Decile Classes										
			D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	All
Calorie	Rural	1993-94	1711	1940	2094	2211	2321	2401	2514	2620	2850	3552	2427
		2004-05	1812	1929	2010	2187	2260	2370	2606	2973	2813	3069	2405
	Urban	1993-94	1838	2041	2169	2279	2266	2370	2531	2700	2886	3211	2432
		2004-05	1786	1965	2047	2137	2156	2219	2349	2437	2550	2959	2261
Protein	Rural	1993-94	52.4	55.7	60.0	63.0	65.5	67.4	70.4	73.0	79.7	97.1	68.6
		2004-05	52.0	54.7	56.8	62.1	64.4	70.5	78.8	75.0	92.7	85.0	69.3
	Urban	1993-94	53.4	58.4	61.2	64.0	63.5	65.6	71.2	74.0	79.0	87.5	67.9
		2004-05	51.8	56.7	57.5	64.2	61.6	61.1	64.5	66.8	70.4	82.9	63.8
Fat	Rural	1993-94	21.5	27.7	31.1	34.1	38.7	41.5	44.5	47.6	54.6	76.6	41.9
		2004-05	27.3	32.2	36.8	43.2	44.7	50.3	58.7	63.6	71.6	86.6	51.6
	Urban	1993-94	27.0	37.4	42.9	47.9	51.8	57.6	64.9	73.2	81.8	99.8	58.6
		2004-05	34.3	41.9	47.0	52.4	56.0	60.1	66.4	71.6	78.8	103.8	61.3

Note: As in Table 1. D1 through D10 denote decile classes. Average values for decile classes are computed from grouped data available for monthly per dapita expenditure classes.
Source: NSSO (1996 and 2007).

Tables 1, 3 and 4 illustrate that average consumptions are declining over time and that average consumption in Maharashtra has been lower than that for India. The tables also show an overall shift from cereals to other items including oil and fats. There is scope for increasing the diet composition to include more milk and milk products, fruits and vegetables, and meat, egg and fish.

Consumer unit consumption over time (from 1993-94 to 2004-05) by decile classes (Table 6) indicates the following. There has been a decline in average calorie for D2 through D6, D9 and D10 deciles in rural areas and for all deciles in urban areas. Protein consumption shows a decline for D1 through D5 and D10 deciles in rural areas and for all, except D4, in urban areas. Fat consumption has shown an increase in all decile classes for both rural and urban areas. The decline in the average cereal and protein consumption for the lower decile classes is a matter of concern. Now, we take up discussion of average adjusted consumption per consumer unit across sub-groups of population in Maharashtra for 2004-05.

Average Adjusted Consumption across Sub-groups

In a seminal paper, (Minhas 1991) suggested that some households might be distributing food to outside members such as guests and employees whereas some others may be eating in other households. In short, there is a possibility of overestimating consumption for servers and underestimation for recipients of food. To address this, a correction factor has been given,

$C_a=CA$; $A=(M_h+M_f)/(M_h+M_g)$.

Here, C_a is adjusted consumption, C is consumption prior to adjustment, A is the adjustment factor, M_h is the number of meals consumed by household members in the household, M_f is the number of meals ate free by household members outside the household and M_g is the number of meals given free to guests and employees. Note that if $M_f>M_g$ then the household is a net recipient and $A>1$ whereas if $M_f<M_g$ then $A<1$ and the household is a net server. It is true that this is an approximation and should not have large differences at an aggregate level, but may correct for inequities that is largely because of the data limitation and not because of differences in nutrition intake.

Table 7 provides average adjusted consumption of calorie, protein, fat and cereal per consumer unit across sub-groups of population in rural and urban Maharashtra for 2004-05. We will first discuss rural Maharashtra. Across the six NSS regions in the state, the coastal region has the lowest calorie and protein consumption. Its fat consumption is only higher than the eastern region and its cereal consumption is above inland northern. The inland western region has the highest calorie, protein and fat consumption. The inland northern region has the lowest cereal consumption and its calorie consumption is above coastal region only.

Social group wise patterns for rural Maharashtra indicate that 'others' have the highest calorie and fat consumption but it is the Other Backward Classes (OBCs) that have the highest protein consumption and their calorie consumption is just one unit lower than 'others'. Scheduled tribes have the lowest calorie, protein and fat consumption and above them are the scheduled castes. Cereal consumption is the lowest for 'others' and the highest for OBCs.

Table 7 Average Adjusted Consumption of Calorie, Protein, Fat and Cereal per Consumer Unit across Sub-groups of Population for Rural and Urban Maharashtra, 2004-05

Sub-groups		Rural				Urban			
		Calorie (Kcal)	Protein (gm)	Fat (gm)	Cereal (kg)	Calorie (Kcal)	Protein (gm)	Fat (gm)	Cereal (kg)
NSS Region	Coastal	2183	52.4	40.5	12.6	2214	60.1	63.4	9.1
	Inland Western	2577	74.1	64.8	13.0	2370	65.8	63.2	10.9
	Inland Northern	2239	61.5	55.1	12.3	2260	61.9	64.6	10.8
	Inland Central	2427	70.1	50.4	14.1	2302	66.2	53.3	12.1
	Inland Eastern	2516	71.4	46.8	14.3	2352	64.2	55.5	11.9
	Eastern	2401	61.2	38.4	14.8	2518	68.2	56.6	13.4
Social Group	Scheduled Tribes	2167	59.0	37.4	13.4	2273	60.9	56.4	11.2
	Scheduled Castes	2338	66.2	46.2	13.7	2202	62.1	53.5	11.0
	Other Backward Classes	2498	70.4	53.6	13.7	2288	61.9	58.9	11.0
	Others	2499	68.7	59.7	13.2	2313	63.6	64.9	10.0
Size-class of Land Possessed	Landless, 0-0.1 ha	2297	63.4	47.7	13.0	NA	NA	NA	NA
	Marginal, 0.1-1 ha	2384	64.0	48.7	13.5	NA	NA	NA	NA
	Small, 1-2 ha	2477	73.0	53.8	13.8	NA	NA	NA	NA
	Semi-Medium, 2-4 ha	2608	73.2	61.5	13.9	NA	NA	NA	NA
	Medium, 4-10 ha	2708	76.1	65.0	14.0	NA	NA	NA	NA
	Large, 10+ ha	2758	77.3	69.8	13.8	NA	NA	NA	NA
Religion	Hindus	2447	67.9	53.5	13.5	2328	63.2	63.4	10.5
	Muslims	2265	65.1	48.5	12.4	2094	60.6	51.5	10.2
	Christians	2307	57.8	51.9	12.2	2449	69.0	71.5	9.9
	Sikhs	2798	78.3	86.5	10.8	2695	73.3	85.1	11.2
	Jains	2787	76.5	70.6	13.8	2387	64.4	80.9	8.9
	Buddhists	2279	65.0	39.3	13.8	2219	61.5	51.2	11.4
	Zoroastrians	NA	NA	NA	NA	3179	92.0	101.7	10.1
	Others	2681	77.6	67.8	13.0	2364	62.7	78.6	9.9
House-hold Type	Household type 1	2400	65.0	56.4	12.6	2249	62.4	61.2	10.3
	Household type 2	2303	64.0	42.5	13.8	2293	62.3	62.7	10.2
	Household type 3	2296	61.6	46.9	13.0	2174	62.3	45.7	11.9
	Household type 4	2584	73.7	60.3	13.8	NA	NA	NA	NA
	Household type 9	2552	69.3	65.4	12.3	2811	74.4	82.7	10.7
Maharashtra State		2430	67.6	52.5	13.5	2287	62.8	61.2	10.4

Note: NA denotes not applicable. NSS denotes National Sample Survey. Kcal denotes Kilo Calorie, gm denotes gram, kg denotes kilogram, ha denotes hectare. Adjusted consumption of Calorie, Protein and Fat are per consumer unit per day whereas that of Cereals is per consumer unit for 30 days. These estimates deviate from those given in Table 3 by less than 3% in rural, and by less than 2% in urban. NSS region and its equivalent administrative division is as follows: Coastal is Konkan division, Inland Western is Pune division plus Ahmednagar district, Inland Northern is Nashik division but excludes Ahmednagar district, Inland Central is Marathwada division, Inland Eastern is Amravati division plus Nagpur and Wardha districts, and Eastern region is Nagpur division after excluding Nagpur and Wardha districts. In rural areas, household type 1 through 4 and 9 denote Self-employed in non-agriculture, Agricultural labour, Other labour, Self-employed in agriculture and Others respectively; in urban areas, household type 1 through 3 and 9 denote Self-employed, Wage earnings/Salaried, Casual labour, and Others respectively. For rural one household (coastal region, scheduled tribe, landless, Hindu, household type others) has entry for toddy as 60000 litres; we have corrected this to 60 litres. Similarly, for urban one household (coastal region, caste others, Zoroastrian, household type wage/salaried) has entry for butter as 200 kilograms; we have corrected this to 200 grams.

Source: Calculated from unit level data of Schedule 1.0, NSS 61st Round, National Sample Survey Organization, Government of India.

Continuing to look at rural Maharashtra, size-class of land possessed shows a very secular increase in all categories of consumption, calorie, protein, fat and cereals. There is one exception. Cereal consumption for large size-class is lower than semi-medium and medium size class.

Analysis by religion indicates that Sikhs, Jains, 'others', and to a lesser extent Hindus have a calorie consumption that is higher than the state average. Muslims have the lowest average calorie consumption. Buddhists and Christians also have average calorie consumption that is lower than the state average. Sikhs have the lowest cereal consumption. This is mostly because of their preference of wheat over rice, which is eaten in combination with non-cereals; Christians have the lowest protein consumption; and Buddhists have the lowest fat consumption.

Across household type, calorie and protein consumption is the highest for those self-employed in agriculture; it is relatively lower for agricultural labourers and other labourers. Protein consumption is the lowest for other labourers whereas fat consumption is the lowest for agricultural labourers.

Now, let us look at the patterns in urban areas. The NSS region wise pattern shows that the eastern region has the highest calorie and protein consumption. Calorie, protein and cereal consumption is the lowest in the coastal regions whereas fat consumption is the lowest in inland central. In the eastern and inland northern regions, the average calorie consumption is higher in urban areas than in rural ones.

Social group patterns for urban Maharashtra indicate that calorie and fat consumption is the lowest for scheduled castes whereas protein consumption is the lowest for scheduled tribes. Others have the highest calorie, protein and fat consumption and the lowest cereal consumption.

The religion wise pattern for urban Maharashtra indicate that Zoroastrians have the highest calorie, protein and fat consumption, and Buddhists have the highest cereal consumption. Muslims have the lowest calorie and protein consumption, Buddhists the lowest fat consumption and Jains the lowest cereal consumption.

Let us now examine patterns of calorie and fat consumption across household types. 'Other' household types fare the best. Next come wage employed/salaried, then the self-employed. Casual labourers have the lowest average calorie consumption. Protein consumption is also highest for 'other' households and lowest for casual labourers; it is important to note that there is very little difference between three groups, if one excludes 'others'. For cereal consumption, it is the highest for casual labourers and the lowest for wage employed/salaried.

Table 8 displays the percentage of calories derived from each food group for various population subgroups. Its analysis shows that vulnerable groups like continue to receive a high share of their calories from cereals. Some of these groups, such as the inland northern region, get a higher share of their calories from edible oils.

Table 8
Distribution of Per Consumer unit Calorie across Food groups by Sub-groups of Population for Rural and Urban Maharashtra, 2004-05

Sub-groups		Rural												Urban									
		Share of Calorie Consumed (%)											All Calorie, Kcal	Share of Calorie Consumed (%)										All Calorie, Kcal
		Cereals & substitutes	Pulses & products	Milk & milk products	Edible Oil	Egg, Fish & Meat	Vegetables & fruits	Dry-fruits	Sugar	Spice, Beverage & pan	Intoxicants	All		Cereals & substitutes	Pulses & products	Milk & milk products	Edible Oil	Egg, Fish & Meat	Vegetables & fruits	Dry-fruits	Sugar	Spice, Beverage & pan	Intoxicants	All	
NSS region	CO	66.2	5.0	2.9	10.8	1.0	4.1	1.1	6.1	2.7	0.1	100.0	**2183**	47.1	6.1	10.1	13.6	1.3	6.6	1.3	6.4	7.4	0.1	100.0	**2214**
	IW	57.6	4.7	7.4	10.6	1.2	4.3	3.8	7.5	2.8	0.1	100.0	**2577**	52.9	5.2	8.4	12.0	1.0	5.0	3.4	7.3	4.8	0.1	100.0	**2370**
	IN	61.5	5.3	4.5	13.1	0.4	3.7	2.7	7.4	1.5	0.1	100.0	**2239**	53.9	5.1	7.7	14.8	0.7	4.9	3.1	7.4	2.2	0.1	100.0	**2260**
	IC	66.0	5.2	5.3	8.8	0.3	3.4	2.5	6.9	1.5	0.0	100.0	**2427**	60.1	4.9	6.4	10.5	0.7	3.9	2.9	6.8	3.7	0.0	100.0	**2302**
	IE	65.4	6.8	2.9	10.0	0.3	3.6	1.1	7.9	2.1	0.0	100.0	**2516**	58.1	5.9	5.7	12.8	0.6	4.5	1.5	7.1	3.4	0.3	100.0	**2352**
	EA	70.9	4.9	2.2	9.7	0.5	3.9	0.5	5.2	2.1	0.1	100.0	**2401**	61.0	6.0	5.4	12.9	0.7	5.0	0.8	6.2	2.0	0.0	100.0	**2518**
Social Groups	ST	70.1	5.4	2.3	9.2	0.6	3.3	1.3	6.0	1.7	0.1	100.0	**2167**	56.2	5.4	5.8	12.8	1.1	5.4	2.0	6.7	4.5	0.2	100.0	**2273**
	SC	66.6	5.6	3.2	9.5	0.5	3.6	2.9	6.6	1.6	0.0	100.0	**2338**	56.8	5.7	5.7	12.4	1.4	5.0	1.9	6.5	4.4	0.3	100.0	**2202**
	OB	62.8	5.5	4.4	10.8	0.9	4.1	2.1	7.3	2.2	0.0	100.0	**2498**	55.1	5.9	7.0	13.3	0.7	5.1	2.1	7.0	3.7	0.1	100.0	**2288**
	OC	60.0	5.0	7.0	10.7	0.5	4.0	2.8	7.5	2.5	0.0	100.0	**2499**	49.4	5.6	10.0	13.0	1.0	5.8	2.1	6.8	6.3	0.0	100.0	**2313**
Size-class of Land	LL	64.3	5.3	3.9	10.5	0.5	3.9	2.0	7.0	2.5	0.1	100.0	2297	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**NA**
	MA	64.9	5.2	4.4	10.2	0.5	4.0	1.9	6.8	2.0	0.1	100.0	**2384**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**NA**
	SM	63.2	5.2	5.0	10.1	1.6	3.8	2.3	7.0	1.9	0.0	100.0	**2477**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**NA**
	SE	60.6	5.3	6.3	10.3	0.4	3.8	3.8	7.3	2.3	0.0	100.0	**2608**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**NA**
	ME	59.3	5.8	7.3	10.7	0.4	3.8	3.0	7.9	1.9	0.0	100.0	**2708**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**NA**
	LA	56.9	5.7	8.8	10.7	0.3	3.7	3.1	8.6	2.2	0.0	100.0	**2758**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**NA**
Religion	HI	62.9	5.3	5.1	10.4	0.6	3.9	2.4	7.1	2.2	0.0	100.0	**2447**	51.5	5.8	8.6	13.2	0.8	5.6	2.2	7.0	5.3	0.1	100.0	**2328**
	MU	62.2	5.2	4.8	10.6	1.3	3.8	2.2	7.4	2.4	0.0	100.0	**2265**	55.6	5.3	7.2	12.1	1.8	4.8	1.8	6.3	5.1	0.0	100.0	**2094**
	CH	60.4	3.0	5.9	13.1	2.8	4.0	0.3	7.2	3.2	0.1	100.0	**2307**	45.3	5.5	10.7	13.4	2.3	7.3	1.3	6.1	7.9	0.2	100.0	**2449**
	SI	44.0	7.8	11.9	15.9	1.1	6.0	1.2	10.5	1.6	0.0	100.0	**2798**	47.4	6.0	12.5	15.7	0.8	5.7	0.5	6.6	4.7	0.0	100.0	**2695**
	JA	57.1	4.4	9.2	10.4	0.0	4.6	4.3	8.3	1.6	0.1	100.0	**2787**	42.3	5.9	17.6	13.4	0.0	6.3	2.0	7.2	5.2	0.0	100.0	**2387**
	BU	68.9	6.2	2.3	8.8	0.5	3.4	1.4	6.7	1.8	0.0	100.0	**2279**	58.4	5.7	5.1	11.9	0.9	5.0	1.8	6.2	4.3	0.7	100.0	**2219**
	ZO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**NA**	35.1	5.4	14.1	12.4	2.9	8.4	1.5	5.2	14.9	0.1	100.0	**3179**
	OR	55.5	5.2	10.2	9.7	0.7	4.3	4.0	6.8	3.5	0.0	100.0	**2681**	48.3	5.7	11.9	17.6	0.0	6.0	1.7	6.2	2.6	0.0	100.0	**2364**
House-hold Type	H1	60.0	5.2	5.7	11.7	0.7	4.2	2.5	7.3	2.7	0.1	100.0	**2400**	52.4	5.7	9.4	12.9	0.9	5.4	2.1	6.9	4.2	0.0	100.0	**2249**
	H2	68.4	5.5	2.8	9.4	0.4	3.4	1.6	6.8	1.7	0.1	100.0	**2303**	50.9	5.8	8.5	13.4	1.0	5.8	2.1	6.7	5.8	0.1	100.0	**2293**
	H3	64.5	4.8	3.8	10.2	0.6	3.9	2.3	6.8	3.0	0.2	100.0	**2296**	62.3	5.3	3.8	10.9	1.4	4.0	1.7	6.5	3.5	0.5	100.0	**2174**
	H4	60.7	5.3	6.4	10.5	1.0	3.9	3.0	7.3	1.8	0.0	100.0	**2584**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**NA**
	H9	55.4	5.4	7.4	12.2	0.6	5.0	2.9	7.4	3.8	0.0	100.0	**2552**	43.4	5.2	10.2	13.1	0.9	6.3	2.4	7.3	11.3	0.0	100.0	**2811**
Maharashtra		63.2	5.3	4.9	10.4	0.7	3.9	2.4	7.1	2.2	0.0	100.0	**2430**	52.2	5.7	8.4	12.9	1.0	5.5	2.1	6.8	5.3	0.1	100.0	**2287**

Note: NSS is National Sample Survey, NA is Not Available, sub-groups are as in Table 8 – the codes are CO is coastal, IW is Inland Western, IN is Inland Northern, IC is Inland Central, IE is Inland Eastern, EA is Eastern, ST is Scheduled Tribe, SC is Scheduled Caste, OB is Other Backward Classes, OC is Other Castes, LL is landless (0-0.1 hectares, ha), MA is marginal (0.1-1 ha), SM is small (1-2 ha), SE is Semi-Medium (2-4ha), ME is medium (4-10 ha), LA is large (10+ ha), HI is Hindu, MU is Muslim, CH is Christian, SI is Sikh, JA is Jain, BU is Buddhist, ZO is Zoroastrian, OR is Other religions, H1 through H4 and H9 indicate household types (see note in Table 7). For rural one household (coastal region, scheduled tribe, landless, Hindu, household type others) has entry for toddy as 60000 litres; we have corrected this to 60 litres. Similarly, for urban one household (coastal region, caste others, Zoroastrian, household type wage/salaried) has entry for butter as 200 kilograms; we have corrected this to 200 grams.

Source: Calculated from unit level data of Schedule 1.0, NSS 61st Round, National Sample Survey Organization, Government of India.

Sikhs get a relatively lower share of their calories from cereals in rural and urban areas and a higher share from other food groups. Jains, as expected, do not consume egg, fish and meat. Zoroastrians are largely based in urban areas and have the highest calorie consumption.

The sub-groups with relatively low calorie intake are coastal and inland northern region, scheduled tribes, scheduled castes, Buddhists, Muslims, agricultural labour and other labour in rural areas and Muslims in urban areas. Almost all these sub-groups, except for Muslims, also have relatively greater consumptions of cereals and lower consumption of non-cereal items. What is worrying is that these sub-groups are relatively active and require greater nutrition.

Calorie Deficiency: Patterns across Sub-Groups

The Planning Commission based on consumption expenditure patterns in 1973-74 had arrived at poverty lines that would ensure a per capita per day requirement of 2400 calorie in rural and 2100 calorie in urban India (the equivalent per consumer unit per day calorie norm is considered to be 3000 in rural and 2600 in urban areas) and also enable 30 days per capita cereal consumption of 15.5 kg in rural areas and 12.25 kg in urban areas.[3] There is some discussion that intake norms need a downward revision because of decrease in activity levels by the population (Suryanarayana and Silva 2007). This is taken into account in our calculation by replacing the per capita norm of the Planning Commission with a consumer-unit norm but by retaining their benchmark of 2400 calories in rural and 2100 calories in urban areas. Based on these limits, we can calculate various measures of calorie-deficiency. We make use of the Foster *et al.* (1984) class of measures,

$$P_\alpha=(1/n)\sum_i((z-y_i)/z)^\alpha.$$

For our purpose, P_α is the alpha class of calorie-deficiency measure, n is total consumer units (population), z is the calorie norm per consumer unit (2400 in rural and 2100 in urban), y_i is the adjusted calorie consumption for the i^{th} calorie poor consumer unit. Thus, P_0, P_1 and P_2 will give us incidence (head count ratio), depth (calorie shortfall gap) and severity (calorie shortfall gap squared) respectively.

Table 9 provides incidence, depth and severity of calorie-deficiency for consumer units across sub-groups for rural and urban areas of Maharashtra in 2004-05. First, we look into the observation in rural areas. Across regions, calorie-deficiency (incidence, depth and severity) is among the highest in coastal region. The ratio of share of calorie poor to share of population is the highest; the other regions with a relatively higher share of calorie poor are inland northern, eastern and inland central. Incidence of calorie poor is more than 55% in all these four regions; it is more than 45% in the remaining two regions. Inland western with a greater share of population (28%) has nearly one-fourth of the calorie-poor; a close second is inland central region. These two regions account for more than 46% of the calorie-poor.

[3] The 2005 dietary guidelines for Americans for a normal adult male population (31-50 years) is 2200 calorie, it would be greater for active population; http://www.health.gov/dietaryguidelines/dga2005/report/ (accessed 18 December 2008). Their norm is slightly higher than our norm for urban areas and lower than our norm for rural areas. It is true that their environment and work conditions are different but it does raise the question even at a consumer unit level of whether our norms require some further revision.

Table 9 Incidence, Depth and Severity of Calorie Deficiency and Share of Population and Calorie Poor Based on Consumer Unit across Sub-groups of Population for Rural and Urban Maharashtra, 2004-05

Sub-group		Rural					Urban				
		Incidence (%)	Depth (%)	Severity (%)	Population (%)	Calorie Poor (%)	Incidence (%)	Depth (%)	Severity (%)	Population (%)	Calorie Poor (%)
NSS Region	CO	69.1	13.6	3.9	11.0	14.1	44.7	7.2	1.8	44.2	50.1
	IW	45.7	6.7	1.4	28.1	23.7	30.3	4.2	0.9	20.7	15.9
	IN	61.1	12.7	3.6	13.8	15.5	43.3	5.8	1.3	8.7	9.6
	IC	55.6	8.6	1.9	22.1	22.7	40.3	6.0	1.3	9.5	9.7
	IE	49.7	7.6	1.7	17.3	15.9	37.7	4.1	0.9	14.0	13.3
	EA	57.0	10.0	2.4	7.6	8.0	20.1	2.8	0.6	3.0	1.5
Social Group	ST	70.5	14.8	4.3	13.6	17.7	41.0	5.6	1.4	3.1	3.2
	SC	63.2	11.3	2.7	14.9	17.4	47.7	7.8	1.8	17.1	20.7
	OB	49.8	8.0	1.8	35.9	33.0	39.0	4.6	0.9	24.0	23.7
	OC	48.5	7.2	1.6	35.6	31.9	37.1	5.7	1.4	55.8	52.4
Size-class of Land Possessed	LL	63.6	11.5	2.9	34.1	40.0	NA	NA	NA	NA	NA
	MA	57.4	10.2	2.5	27.3	28.9	NA	NA	NA	NA	NA
	SM	50.6	8.1	1.8	15.9	14.9	NA	NA	NA	NA	NA
	SE	41.6	5.5	1.2	13.8	10.6	NA	NA	NA	NA	NA
	ME	35.8	4.9	0.9	7.6	5.0	NA	NA	NA	NA	NA
	LA	24.5	1.3	0.2	1.4	0.6	NA	NA	NA	NA	NA
Religion	HI	52.9	8.9	2.2	88.6	86.5	35.8	4.8	1.0	73.1	66.3
	MU	62.8	10.9	2.7	4.7	5.4	54.8	9.7	2.7	17.3	24.0
	CH	60.4	11.5	2.6	0.2	0.2	29.6	5.5	1.4	1.8	1.3
	SI	39.4	6.5	1.1	0.0	0.0	16.3	2.4	0.4	0.2	0.1
	JA	35.6	5.2	1.9	0.3	0.2	29.7	3.2	0.6	1.6	1.2
	BU	67.5	11.1	2.4	6.1	7.6	48.1	8.1	1.9	5.8	7.1
	ZO	NA	NA	NA	NA	NA	3.3	0.0	0.0	0.3	0.0
	OR	4.6	1.0	0.2	0.1	0.0	17.0	2.2	0.3	0.0	0.0
Household Type	H1	56.5	10.2	2.5	11.5	12.0	40.6	6.3	1.6	37.0	38.1
	H2	64.3	11.4	2.9	36.9	43.9	37.6	5.3	1.2	47.6	45.3
	H3	62.7	11.0	2.6	9.2	10.7	55.0	7.8	1.7	10.8	15.1
	H4	43.9	6.7	1.5	34.1	27.6	NA	NA	NA	NA	NA
	H9	38.2	5.6	1.3	8.2	5.8	13.5	1.6	0.4	4.5	1.5
Maharashtra		54.1	9.1	2.2	100.0	100.0	39.5	5.8	1.3	100.0	100.0

Notes: As in Tables 7 and 8. The estimates, including population, are for consumer unit. The calorie bench mark is 2400 for rural and 2100 for urban, the numbers that the Planning Commission's poverty line is supposed to represent for per capita calorie units. That is, we retain their benchmark numbers, but not their unit, thereby reducing incidences.

Source: Calculated from unit level data of Schedule 1.0, NSS 61st Round, National Sample Survey Organization, Government of India.

Social group calorie-deficiency hierarchy is the highest for scheduled tribes (incidence of calorie poor being 71%). Scheduled castes fare slightly better and above them are the other backward classes, with the 'others'

doing better than the rest. Scheduled tribes and scheduled castes constitute 29% of population but account for 35% of the calorie poor.

An increase in the size-class of land possessed reduces calorie-deficiency. Incidence of calorie-poor is the highest for landless at 64%. What is surprising is that even from among large size-class households nearly a quarter are calorie-poor. The landless and marginal size-classes constitute 61% of the population but account for 69% of the calorie-poor.

With regard to religion, Buddhists fare the worst (incidence of calorie poor being 68%), Muslims fare slightly better and then Christians and Hindus. All these groups have an incidence of calorie poor that is more than 50%; it is between 35-40% for Jains and Sikhs and less than 5% for 'others'.

For rural household type, the sequence of ordering (from worst to best) would be agricultural labour, other labour, self-employed in non-agriculture, self-employed in agriculture and others. The incidence of calorie poor is more than 60% for the two rural labour groups and 57% for the rural self-employed in non-agriculture. The fact that incidence of calorie-deficiency is 44% for those rural people self-employed in agriculture highlights the dire state that agriculture is in. For all sub-groups of population in rural areas, incidence of calorie-poor is greater than incidence of expenditure-poor (Chapter 2).

Now we discuss the urban scenario. Here also the coastal region has the highest incidence of calorie deficiency (45%); what is surprising is that this incidence of calorie-poor is higher than the incidence of expenditure poor (15%). Further, between 1993-94 and 2004-05, the proportion of expenditure-poor in the region increased by 2% points. These levels of poverty and calorie deficiency are particularly surprising because Mumbai is located in this region. The hinterland of Konkan always had social and economic ties with Mumbai, the commercial capital of India. The substantial economic growth that Mumbai has witnessed has not helped relieve calorie deficiency and poverty.

Incidence of calorie poor is more than 40% in inland central and inland northern. These three regions comprise 62% of the population but account for 69% of the calorie poor. Incidence of calorie-poor is lowest in the eastern region. Excluding the coastal region, urban areas of the other five NSS regions have an incidence of calorie-poor that is lower than the incidence of expenditure-poor (Table 10, Chapter 2).

The caste wise incidence of calorie deficiency indicates that scheduled castes in urban areas (48%) are the most vulnerable groups. The relatively greater access to calories of scheduled tribes in urban areas is because they stick to their rural mooring and perhaps migrate out only after acquiring some skills. Their share of population in urban areas is only 3% compared to their share of 14% in rural areas. In contrast, the scheduled castes share of population in urban areas is 17% whereas their share in rural areas is 15%. Poor access to opportunities and the stigma of caste discrimination can act as a push factor leading to urban migration of scheduled caste population. Incidence of calorie-poor is higher than the incidence of expenditure-poor for all social groups (Table 9, Chapter 2).

Religion wise distribution indicates that Muslims are the most vulnerable in urban areas with an incidence of calorie-poor of 55%. Their population share is only 17% but their share of the calorie poor is nearly one-fourth. Buddhists also have a higher incidence of calorie-poor (48%). The call of Ambedkar to leave rural areas or even to embrace Buddhism has brought about awakening, but this has not been enough to take them out of deprivations in terms of calorie deficiency. Christians do much better than Hindus in urban areas indicating that they are the better off and well to do. However, as indicated earlier, this is not the case

for rural Christians indicating a socio-economic divide between them and they are likely to be from different ethnic backgrounds.

For different household types, the most vulnerable are casual labourers (incidence of calorie poor being 55%, but this is lower than the incidence of expenditure-poor, 77%, perhaps because the 2100 calorie norm will be much lower for such groups putting in hard labour), the next vulnerable group are the self-employed (41%). Both these groups have a higher share of calorie poor than their population share. 'Other' households have a much lower incidence of calorie-poor (13.5%), which is slightly lower than the incidence of expenditure-poor (13.7%) (Table 7, Chapter 2).

To reiterate, we have made use of per consumer unit calorie norm of 2400 in rural and 2100 in urban areas. This is lower than the Planning Commission's benchmark with the same calorie norm at a per capita level as also the National Institute of Nutrition's benchmark of 2700 calorie per consumer unit (3000 in rural and 2600 in urban). In spite of this reduced norm, we come up with the incidence of calorie-poor at 54.1% for rural areas and 39.5% for urban areas. This is much higher than the incidence of expenditure-poor at 29.6% for rural areas and 32.2% for urban areas. In rural areas, all sub-groups have an incidence of calorie-poor that is greater than the incidence of expenditure-poor. This is not the case in urban areas, as there are some sub-groups with incidence of calorie-poor being lower than incidence of expenditure-poor. The relatively higher incidence of calorie-poor in rural areas is worrying because food is produced in these regions.

To add to this, those self-employed in non-agriculture in rural areas and those self-employed in urban areas are doing worse than the state average and their share of calorie poor is higher than their share of population. This indicates the scarcity of rural non-farm employment opportunities and also portrays that the urban people designated as self-employed are likely to be engaged in highly insecure petty trade. Such a scenario suggests that these self-employed entrepreneurs who are willing to take risk in the market have not received appropriate incentives. The neglect of both agricultural and non-agricultural entrepreneurs is perhaps the biggest failure of the growth process in recent years.

Concluding Remarks

On average, calorie consumption has declined from 1993-94 to 2004-05 and this is particularly so for the lower decile groups. There has been a reduction in cereals and protein consumption, but an increase in fat foods, which could have adverse health implications. There are serious inequities across NSS regions, with the seemingly better off coastal region faring the worst. Caste wise differences reinforced the vulnerability of scheduled tribes and scheduled castes. Religion wise differences brought into the fore the nutrient shortages of Buddhists, and Muslims in both rural and urban areas and Christians in rural areas. The declining incidence of calorie-poor with an increase in size-class of land possessed was expected, but it is worrying that the incidence of calorie-deficiency among consumer units from large size-class in rural areas was still nearly one-fourth. The incidence of calorie-deficient among the household-type 'others' in rural areas is nearly two-fifths. In spite of a reduced calorie norm, more than half of the rural consumer units and nearly two-fifths of the urban consumer units are calorie-poor. This is much higher than the poverty estimates given by the Planning Commission. Poor state of agriculture and an absence of non-farm employment opportunities in rural areas is the biggest drawback of the growth process in recent years. It is a pity that there have been hardly any incentives to help farmers eager to take on the uncertainties of nature or people in the non-farm sector who can develop forward and backward linkages to contribute to the ailing rural economy.

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Chapter 4

Implementation of TPDS and Antyodaya in Maharashtra

Chapter 4

Implementation of TPDS and Antyodaya in Maharashtra

Mahesh Kamble

"We need PDS for the poor, but unless it is efficient, procures adequate quantities of foodgrains and delivers food to the poor, it could become an albatross around our neck and an opportunity for rent seekers to enrich themselves,...About 58 per cent of the subsidised grain doesn't reach the target group, of which a little over 36 per cent is siphoned off the supply chain... Don't the poor deserve a better PDS? How can we sit back and watch the poor being robbed off their meagre entitlements,"

-P Chidambaram, Finance minister, GoI in a meeting of the NDC.
Reported by Gaurav Choudhury, Hindustan Times,

The Public Distribution System (PDS) in India is an important system of ensuring control over the rising prices of essential commodities. PDS also ensure freedom from hunger by ensuring a secure supply of food grains, sugar and kerosene to the poor. The system aims to ensure food security for the poor by distributing food grains and other basic commodities at subsidized prices through fair price shops (FPSs).

In the current scenario of inflation rising into double digit figures, a strong PDS is essential to ensure adequate food supplies to the marginalized and vulnerable. The Supreme Court of India has given various interim orders to ensure this and the state government has been making efforts to translate these orders in the form of cabinet decisions and government resolutions. However, there remain a number of huge challenges when it comes to status of implementation of these decisions. This chapter is an effort to discuss some of the observations regarding implementation of the Antyodaya programme and the Targeted Public Distribution System in the state of Maharasthra. To a large extent this part draws from my involvement in a study titled "Food to the Poor" Kumar *et al* 2008[1].

Introduction

The website of the Food and Civil Supplies Department details the evolution of the PDS system in India. The PDS originally emanated from the critical food shortage in the 1960s with a focus on distribution of foodgrains in urban areas facing scarcity. The system played a critical role in controlling the food prices and

[1] To a large extent, this section draws from the report titled "Food to the Poor". On the request of the advisor appointed by the commissioner of Supreme Court of India on food rights, a research team was commissioned to do a study. The objective of the study was to understand the pattern of implementation of the said schemes to get a picture that was independent of activists and government officials, which could be generalizable to the entire State of Maharashtra. A scientific research study of the grass root implementation of food schemes would better equip the advisor to report to the commissioner about the situations in Maharashtra. The research team consisted of Dr. Sharath Kumar (professor at the College of Social Work, University of Mumbai), Mr. Johny Joseph (Director, Creative Handicrafts, a woman's cooperative group) and Myself- Mr. Mahesh Kamble (subsequently appointed as a Assistant professor at the Tata Institute of Social Sciences, Mumbai). This study was conducted in eight Districts of Maharashtra, randomly selected on the basis of population norms and administrative divisions and involved detailed interviews of TPDS and Antyodaya beneficiaries and observations of FPSs. The study was published by the National Centre for Advocacy Studies in 2008 as "Food to the Poor: A Study of Implementation of the food related schemes of the Government of Maharashtra". The present chapter draws some important observations and data from the said report.

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ensuring urban consumers' access to basic food items. In the aftermath of the green revolution in the 70s and 80s, outreach of PDS was extended to tribal blocks and areas of high incidents of poverty. Until 1992 PDS was a general entitlement scheme for all consumers without any specific target. Experiences showed that it failed to serve the population below the poverty line due to its perceived urban bias, negligible coverage in the states with the highest concentration of the rural poor and lack of transparent and accountable arrangements for delivery. Realising this, the Revamped Public Distribution System (RPDS) was launched in June 1992 to strengthen and improve the reach of PDS to far flung, hilly, remote and inaccessible areas. The RPDS added various components like doorstep delivery, additional ration cards, additional Fair Price Shops, storage capacities, and additional commodities such as tea, salt, pulses, and soap for distribution through PDS outlets. The RPDS took an area approach and was launched in 1775 blocks in tribal hilly and drought prone areas.

The PDS in its present form was started in 1997, when the government streamlined the PDS by issuing distinctive ration cards to families Below Poverty Line (BPL) and providing foodgrains to them at specially subsidised prices. The updated scheme, which remains in place today, was named the Targeted Public Distribution System (TPDS). States are required to formulate and implement arrangements for identification of the poor, delivery of food grains to FPSs and the distribution of supplies in a transparent and accountable manner. An additional program, the Antyodaya Anna Yojana (AAY), was launched in December 2000 for the 'poorest of the poor' families to provide them food grains at a highly subsidised rate.

In order to maintain supplies and securing availability and distribution of essential commodities, Public Distribution System (Control) Order, 2001 has been notified on 31 August, 2001. The Order mainly contains provisions with regard to the following issues:

1. Identification of families below the poverty line;
2. Ration cards;
3. Scale and Issue price;
4. Distribution of foodgrains;
5. Licensing;
6. Monitoring.

The Order requires all the state governments/union territories (UTs) to ensure that the BPL and Antyodaya families identified are really below poverty line and, in the case of Antyodaya families, are really the poorest of the poor. It also requires the state governments/UTs to review lists of BPL and Antyodaya families every year for the purpose of deletion of ineligible families and inclusion of eligible families and to conduct periodic ration card checks to weed out ineligible and bogus ration cards. State governments are also to ensure that Utilisation Certificates are issued, confirming that the food grains have been lifted and distributed to the intended beneficiaries under the schemes.

Under the TPDS, ration card holders are divided into three different categories, namely, white card holders (whose annual family income is above Rs.1 lakh), saffron card holders, typically referred as above poverty line (APL) (whose annual income is below Rs. 1,00,000 and above Rs.15000 per annum) and yellow card

holders or below poverty line (BPL) (whose annual family income is below Rs.15000). People with no visible means of livelihood and are 'poorest of the poor' are designated Antyodaya beneficiaries. The TPDS does not serve the white card holders. The Antyodaya beneficiaries and the BPL and APL (i.e. yellow and saffron card holders) are eligible to get grains every month at a subsidised rate.

The initial entitlement of 10 kg per family per month grains was increased to 20 kg per family per month in April 2000, to 25 kg in July 2001 and further to 35 kg per family per month with effect from April, 2002. Thus presently all beneficiaries are entitled to a monthly quota of 35 kg per family. For the APL category quota has also been fixed at 35 kg per family per month with effect from 1 April 2002.

PDS is a joint collaboration of central and state governments. Thus, responsibilities of work under this system are shared by both parties. The central government procures and stores food grains and allocates them to the state government which is responsible for identifying families below the poverty line, issuing ration cards, allotmenting commodities, supervising and monitoring the function of FPS.

The retail price of grains is fixed by the states/UTs after taking into account margins for wholesalers/retailers, transportation charges, levies, and local taxes. At present, the prices for BPL card holders in Maharashtra are Rs.5 for wheat and Rs.6 for rice. The APL prices are Rs.6 for wheat and Rs.9.50 for rice (GR ADP 1001/2028/1797/ CS 22). However the government has recently issued instructions through a new GR (ADP 1508/ 3263/CS 22 dated 30 June 2008) stating that APL cardholders shall be given five kg rice at the rate of Rs.12 a kg. The resolution does not mention the 35 kg quota or any details pertaining to the wheat allocation. In case of Antyodaya Anna Yojana the retail price is fixed at Rs.2 per kg for wheat and Rs.3 per kg for rice.

Coverage

In Maharashtra the Department of Food and Civil Supplies is responsible for the implementation of the schemes. According to the Economic Survey of Maharashtra 2007-08, there are 50,083 FPSs in Maharashtra. Though the union government set a target of issuing 65.34 lakh yellow ration cards, the state actually issued more yellow cards (69.60 lakh). After the third expansion, the total target number of Antyodaya cards has been set at 25.05 lakh, out of which 24.64 lakh families have currently been identified and have begun receiving benefits. There are 0.41 lakh families remaining who have not yet been identified, meaning that there are approximately two lakh extremely poor people who are still deprived of their entitlement for heavily subsidized food grains.

Table 1 Entitlements and beneficiaries under TPDS and Antyodaya

Card type	Eligibility criteria (annual income)	Costs (per kg)	Actual number of card holders in Maharashtra (in lakhs) March 2008
White	Above Rs.1,00,000	Food purchased at market price	8.38
Saffron	Rs.15,001 to Rs.1,00,000	Wheat: Rs.7.20 Rice: Rs.9.60	140.04
Yellow	Up to Rs.15,000	Wheat: Rs.5 Rice: Rs.6	69.60
Antyodaya*	No visible means of income	Wheat: Rs.2 Rice: Rs.3	24.64

*Antyodaya beneficiaries are identified from amongst BPL (yellow card holders).
Source: Economic Survey of Maharashtra 2008-09

The number of beneficiaries of the schemes has been steadily declining over the last few years, as displayed in Table 2.

Table 2 Number of ration cards issued per year

Year	2005	2006	2007	2008
White	10.80	9.91	9.70	8.38
Saffron	144.95	140.94	138.62	140.04
Yellow	74.42	71.87	71.34	69.60

Source: Economic Survey of Maharashtra 2008-09

The state government launched a special detection drive in 2005 to weed out ineligible and bogus ration cards. Under this scheme, up to 2008, about 29.45 lakh ration cards were cancelled on the basis of not providing proof or not filling in the prescribed form. Food rights activists claim that names of many eligible beneficiaries have been deleted from the lists as vulnerable groups such as migrant laborers, nomads and commercial sex workers were not able to provide any proof of residence. Food rights activists attribute this trend to the undeclared policy of the government to sabotage the public distribution system by excluding eligible people from it.[2]

[2] Discussion with Food rights activists: Mr Suresh Sawant, Mr Lakshman Dasari, Ms Leena Joshi, Ms Ulka Mahajan

Though annual income is the major criterion used, there are also other criteria used for identification of beneficiaries for these categories.

White Ration Cards:

1. Annual income of Rs.1 lakh or above,
2. Any member of the family possessing a four wheeler or
3. The family aggregately holding more than four hectares irrigated land

Saffron Ration Cards:

1. Families having annual income of Rs.15,001 to 1 lakh.
2. None of the members in the family should have four wheeler mechanical vehicles (excluding taxi).
3. The family in all should not possess four hectares or more irrigated land.

Yellow Ration Cards:

1. Families having annual income up to Rs.15,000
2. None of the members in the family should be a doctor or lawyer or architect or chartered accountant.
3. None of the members in the family should be professional tax payers, sales tax payers or income tax payers or eligible to pay such tax.
4. The family should not possess a residential telephone.
5. The family should not possess a four wheeler vehicle.
6. All the persons in the family should not hold total two hectares rainfed or one hectare semi-irrigated or 1/2 hectare irrigated (double in drought affected talukas) land.

- Unless and until the target of BPL beneficiaries under Targeted Public Distribution System is enhanced by the Government of India, the existing target of BPL beneficiaries for the districts cannot be enhanced. Subject to this condition, the criterions that the beneficiary should not hold Liquified Petroleum Gas LPG connection and own two-wheeler and other criteria have been deleted (government resolution (GR) dated 25 May 2005).
- The Government has decided to issue a BPL ration card on a temporary basis to all Vidi workers, and Pardhi and Kolhati community members (GR dated 9 September 2008).

The Government has decided to issue a BPL ration card on a temporary basis to abandoned women (GR dated 29 September 2008 and 21 February 2009).

Considering that the state's population is increasing, there is no reason why the issuance of ration cards should be reducing. This downward trend is indicative of reduced number of beneficiaries of the rationing schemes.

In 2007 the state began issuing computerized ration cards "to avoid malpractices and misuse of ration cards." Activists claim that in the name of issuing computerised cards soon, officers have stopped issuing new cards and it is almost impossible to get a new card in BPL category. A huge number of poor people who are in desperate need of TPDS benefits are excluded from the schemes, a violation of their human right to adequate food.

Though the existing number of yellow ration cards show that the target is already achieved, people find it virtually impossible to get a new card. The clear directions from the state government to issue ration cards to vulnerable groups even if they can not provide proof of residence are not being implemented at the district level.

'Target' or 'Quota'

When the Targeted PDS was introduced in 1997, the economic criteria for a poverty line TPDS card was set at an annual income of Rs.15, 000 for urban, Rs.11,000 for tribal and drought prone area and Rs.4,000 for rural areas. In 2001, the criteria for rural, Integrated Tribal Development Projects (ITDP) and Drought Prone Area Programme (DPAP) areas was revised to bring it on par with that for urban areas and a uniform criteria for urban, rural and tribal areas was set at an annual family income of Rs.15,000.

On the basis of the state's 2000-1 population, the union government created a target for beneficiaries under the poverty line. Based on this target, the state has to identify beneficiaries for the scheme. The Integrated Rural Development Program IRDP 1997-98 lists are considered for giving benefits under these schemes.[3] Since this list is drawn by the Department of Rural Development, the Department of Food and Civil Supplies denies any responsibility for the exclusion of eligible beneficiaries.

In spite of rising food costs, rising oil process, rising inflation, increasing GDP, changing income levels and pay commissions, this criteria has remained unchanged for urban areas since 1997. It is interesting to note that within this criterion, in spite of a huge number of people staying in slums and on streets, homeless, and working as unorganized casual labourers, only 1% of Mumbai's population is considered BPL.

The 'target' in PDS is effectively used as a 'quota'. Food right activists claim[2] that government officers justify the exclusion of genuine applicants by saying that 'the target is completed'. Since the number of beneficiaries is greater than the prescribed 'target,' many eligible beneficiaries are deprived of the benefits of the schemes. This is a clear violation of the Supreme Court order that stated that every eligible person should receive the benefit of the schemes, notwithstanding quotas or any other limitations put in place.

Ironically, the Supreme Court's order mentions in an unambiguous tone that all members of primitive tribes will be given an Antyodaya card (Supreme Court order dated 2 May 2003 and GR on 10 December 2004), but in reality, there also exists a quota for members of primitive tribes eligible to be Antyodaya beneficiaries. Incidentally, the GR of 25 November 2005 specified that while the category-wise number of beneficiaries in a ward/village might vary, care should be taken to see that the total number of beneficiaries for the district does not go above the allocated quota (GR No. PDS/1005/1779/28). Instead of using the target system for inclusion of rightful beneficiaries, the system is actually being used for their exclusion. This is a clear violation of Supreme Court order. The 'quota' system is against the spirit of these orders and against the right to life enshrined in the Constitution of India.

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[3] The state underwent an exercise to identify beneficiaries with a new poverty line for 2002-07, but the list is not yet finalized and the TPDS and Antyodaya benefits are still given as per the 1997 IRDP list.

Food rights activists[2] have been demanding a revision of the criteria on logical and reasonable grounds with separate criteria for urban, rural and tribal areas.

Ration card

Recognizing that every citizen has a right to a ration card, the state government has passed various resolutions to facilitate the process of issuing ration cards in a smooth manner. However, food rights activists[2] claim that it rarely happens. In our research it was seen that considering the time taken to get the card, amount to be paid and documents required, "one in every five beneficiaries of the TPDS and Antyodaya scheme faced difficulties while trying to get the card." (Kumar, *et al* 2008)

The Maharashtra government has already released a number of GRs to relax the conditions regarding proof of residence for marginalized groups, such as unorganised workers, homeless, deserted women and widows, commercial sex workers and migrant workers. However, by and large these groups are deprived of ration cards as they fail to provide a proof of residence. As a result, hundreds of applications filed by members of these groups are pending in various rationing offices across the state and in Mumbai, as reported in various public hearings conducted by Anna Adhikar Abhiyan[4] (cite where the reader can find this information).

The sample survey conducted by the NSSO 61st round on the 'Public Distribution System and Other Sources of Household Consumption' in 2004-05 revealed some critical facts about the issuance of ration cards to marginalized groups.

Table 3 Status of issuance of ration cards per 1000 households in Maharashtra

	Number of households with no ration cards (per 1000	Number of households with Antyodaya cards (per 1000)
Urban	247	3
Rural	189	44
Urban poor (monthly per capita expenditure of less than Rs.335)	316	23
Rural poor (monthly per capita expenditure of less than Rs.235)	260	184
Scheduled caste (urban)	240	3
Scheduled caste (rural)	189	49
Scheduled tribes (urban)	370	19
Scheduled tribes (rural)	217	148
Casual laborer (urban)	371	7
Agricultural and other laborer (rural)	245	61

Source: NSSO report no. 510(61/1.0/3), 2004-05

[4] Presentations in public hearings conducted by Anna Adhikar Abhiyan in different parts of the state

The report shows that almost one-fifth of households in rural and one-fourth of households in urban areas do not have any ration cards. Overall, about one in every four or five households in Maharashtra do not get benefits of the public distribution system. Amongst the poorest of poor families in urban areas, (i.e. those with a monthly per capita expenditure of less than Rs.335) one in every three households does not have a ration card and only 2% have an Antyodaya card. The situation in worse in rural areas where amongst the poorest of poor families (i.e. with monthly per capita expenditure of less than Rs.235), one-fourth do not possess a ration card. The percentage of households having an Antyodaya card in urban areas is only 0.3%.

Caste plays an important role in marginalization and vulnerability. Caste-wise analysis of exclusion also shows some shocking facts. Amongst the scheduled castes almost one-fifth in urban and one-fourth in rural households do not have any ration cards. The percentage for scheduled tribes is much higher with more than one-third in urban and one-fifth in rural areas without any ration card. Thus amongst the SCs and STs who are the most marginalized groups in the state, on an average one out of four households does not hold any card and are excluded from the public distribution system. Only 17% of STs and 5% of SCs have Antyodaya cards.

Just over half (54.2%) of the landless households (holding less than 0.01ha) in rural Maharashtra do not possess any card and only 5.7% of them have Antyodaya cards. Similarly, 24% agricultural and other laborers in rural areas do not possess any card. More than one out of three casual laborers in urban areas does not have any cards and a meager of 0.7% posses an Antyodaya card.

The data clearly shows the extent of exclusion of eligible beneficiaries from the benefits of TPDS and Antyodaya. These are the families at extreme risk of hunger and still excluded from the PDS.

New guidelines issued by the Home Ministry of Union Government have worsened the problem. These guidelines require that the applicant produces a 'character certificate' issued by the police (Food and Civil Supplies 2008). Linking ration cards to 'character' is against the spirit of the 23 March 2004 GR (PDS / 1103 /2278/ 1336/28), which specifies that ration cards cannot be used for any other purpose than ensuring the receipt of rations. A similar sentiment is expressed in writing on ration cards themselves. There seems a lack of clarity about the guidelines as the local police station denies issuing such certificate. The families of criminals, ex-criminals, de-notified tribes, and commercial sex workers would find it nearly impossible to get such a certificate from the police. Food rights activists[2] also question the supposed linkage between 'character' and issuance of a ration card which is primarily for claiming food rights. After a lot of protests from various civil society groups, legislative members and media against this decision, the government had to temporarily suspend this decision (misc/4107/872/73/08/ CS 28 dated August 6, 2008)

The government has decided to computerize the ration cards (GR SVP- 1507/1583/316/28 dated 5 July 2008). Beneficiaries must now possess these computerized cards to claim their rations. BPL beneficiaries have to pay Rs.49 and APL beneficiaries must have to pay Rs.86. These are extremely high costs compared to earlier Rs.10 and Rs.20, respectively.

These are just a few examples which show how the government is making it difficult for people to claim their ration cards. The policy makers must understand that such decisions affect the vast majority of

population which live in hand-to-mouth conditions. Any decision which makes claiming food rights more difficult is a violation of their right to life, as most of these marginalized people can not afford to by food grains from the open market and exclusively depend on ration shops.

Utilization of schemes

Apart from the problems in getting the ration card and regarding exclusion, the beneficiaries face various other problems when they try to claim their entitled grains from the FPS. The state government has followed most of the guidelines and instructions issued by the Supreme Court, and have made various decisions to increase system effectiveness. However the study we did (Kumar *et al.* 2008) showed that the implementation of these decisions is far from satisfactory. Some of the problems are summarized below.

Non availability of food grains

Across the state beneficiaries of the BPL and Antyodaya schemes frequently report that they do not receive enough food grains as per the quota. In our study, 62.8% TPDS and 48.2% Antyodaya beneficiaries mentioned that the 35 kg allocated to their family is inadequate. Furthermore, 50.3% of BPL and 50.6% of Antyodaya beneficiaries stated that the grains were generally not available when they visited the ration shop for purchase. About one-third of the beneficiaries reported that the grains supplied by their respective ration shop were not in accordance with the quota, i.e. 35 kg allocated to each family. These findings have to be seen in the light of the fact that the per capita per day income of the beneficiaries was in the range of Rs.5-7.30, which shows a total dependency on the PDS as they can not afford to purchase from open market. If they do not get enough grains as per their entitlement, they are at extreme risk of hunger and starvation.

The NSSO report no. 510(61/1.0/3) confirms this observation. It showed that the Antyodaya and BPL beneficiaries have to depend on the open market to purchase grains. For example, what the poorest of poor in rural areas (with monthly per capita expenditure of less than Rs.235) spend to purchase rice from open market is almost double than what they spend to purchase rice from PDS.

Under utilisation of food grains

A very high proportion of the grains received by the state from the national government for subsidized distribution remain unutilized. In 2007-08, about 3.5 lakh metric tones of grain were not utilized in the state. This type of underutilization seems to be the pattern over a long period of time.

Table 4 Utilization of grains (wheat and rice) under BPL category.

Year	Allocation received from GoI	Amount distributed to district storage centres	Amount picked up by districts from storage	Offtake (amount purchased through FPSs)	Amount not reaching beneficiaries	Percentage reaching beneficiaries[a]
2004-05	2,100,969	2,097,029	1,790,717	1,728,106	372,863	82.25
2005-06	1,912,776	1,912,776	1,619,133	1,636,183	276,593	85.54
2006-07	1,883,762	1,883,762	1,557,950	1,528,124	355,638	81.12
2007-08[b]	1,784,133	Data missing	1,372,694	1,436,412	347,721	80.51

(Source: data obtained from the department of Food and Civil Supplies, GoM, 2009)
Figures are in metric tons and include rice and wheat
a. percentage calculated for offtake as part of allocation
b. includes Bajra and Maize

The trend of reduction in allocation also must be noted. The allocation of food grains to the state is made on the basis of average consumption in the past. If the state does not pick up its allocated quota it is reduced in the future, which is clearly seen in case of Maharashtra where the allocations have reduced by more than three lakh metric tons in the last four years. Similar trends of less utilisation is observed in lifting by the districts and offtake through FPSs. It shows that the poor are getting less and less grains every year.

The state is receiving most of its allocation, which is further distributed to the districts. The districts, however, are not picking up the full quota allocated to them. It seems that almost one-fifth of the total allocation goes without utilization. The data for Antyodaya also shows a similar pattern (Table 5).

Table 5 Utilization of grains (wheat and rice) under Antyodaya.

Year	Allocation received from GoI	Amount distributed to district storage centres	Amount picked up by districts from storage	Offtake (amount purchased through FPSs)	Amount not reaching beneficiaries	Percentage reaching beneficiariesa
2004-05	643,335	639,887	597,998	566,319	77,016	88.03
2005-06	831,528	831,528	738,504	738,692	92,836	88.84
2006-07	860,542	860,542	711,685	720,048	140,494	83.67
2007-08	1,021,671	Data missing	834,585	861,324	160,347	84.30

Source: data obtained from the department of Food and Civil Supplies, GoM, 2009
Figures are in metric tons and include rice and wheat
a. Percentage calculated for offtake as part of allocation

Mahesh Kamble

Over the last four years, the *amount* of grain allocated, picked-up, and sold under the Antyodaya scheme has been increasing. However, the *percent* of grains reaching the beneficiaries has been decreasing. This decrease shows that greater diligence must be taken to ensure that the grain that reaches the storage centres ends up in FPSs. If the scheme is properly implemented, people will claim and utilize the grains and there will not be any underutilization and wastage.

Excerpts of the discussion with villagers regarding functioning of the PDS shop

One of the researchers from SATHI conducted discussions with the villagers to prod the issues regarding functioning of the PDS shop in their villagers. Some of the complaints which emerged from these discussions are:

- The location of the PDS shop is not convenient as it is away from the main village.
- The Ration shop opens only once a week and that too for few hours.
- The monthly quota for all the families in the village comes to the shop every month but the families are not given the entire quantity of food assigned. They get a maximum of 25 kgs instead of assigned 35 kgs of grains. They have to buy the additional grains from the shop. The beneficiaries suspect that the additional quantity of grains is sold to local restaurants. Sometimes even the rich in the village get a share of this.
- Sugar is not given as a part of TPDS.
- Kerosene allowance by the standard norms is 1.5 litres per person per month. But all the families in the village get only 5 litres of kerosene each month irrespective of the number of family members.

Servicing the beneficiaries

Despite the government orders which say that the shop timings shall be convenient and suitable to the beneficiaries, most of the shops do not remain open according to stipulated timings. Our research (Kumar *et al.* 2008) showed that more than one-third of the shops do not follow these instructions. Since most of the beneficiaries are daily wage earners and hence busy during the day, inconvenient and irregular shop hours is a major concern.

Since most of the beneficiaries of these schemes are from the most marginalized and poor groups, they prefer to buy their ration in smaller installments depending on the amount of cash available with them. Quite often the shops owners do not allow the beneficiaries to do so and insist that they buy the full quota at one time. Many beneficiaries can not afford this and have to forgo their rations. Many shop owners also do not follow the guideline of allowing the beneficiaries to purchase their quota in the following month, if they can not afford to purchase in the same month. They say that the quota has 'lapsed' and the beneficiaries are denied the grains to which they have a right. This particularly affects migrant laborers and nomadic tribes that may not be in the position to purchase their quota every month. Many shop owners also insist that the beneficiaries purchase other items from the shop if they want to access their ration. Beneficiaries are denied their quota of food grains unless they purchase some other non-PDS items from the shop. In these ways the shop owner makes it difficult for beneficiaries to purchase their full quota of grains, leaving a lot of unsold food stock, which eventually can be sold in the open market.

The Essential Commodities Act (1955) lists the responsibilities of the FPS owners, which include:

- Display information, such as beneficiary's entitlement of various essential commodities, the issue prices, name of fair price shopkeeper, timing of opening and closing of FPS, weekly closing days, stock position, etc.
- Display procedure for lodging the complaints with reference to quality and quantity of ration and other problems being faced by the beneficiaries.
- Maintain records of ration card-holders, stock position, issue register, issue prices, etc.
- Furnish copies of certain documents including ration card, register, stock register and sales register concerning PDS to the interested groups.
- Display samples of foodgrains being supplied through FPSs.

The state government also has issued various orders to this effect to bring in more transparency in the functioning of the ration shops and to make them accountable. However our study showed that 30% to 60% of the shops do not follow one or more of these guidelines (Kumar *et al* 2008). Lack of transparency also limits expectations of the beneficiaries due to lack of proper information. If people do not know their rights, how will they claim them?

Above 60% of beneficiaries in our research mentioned that they did not have to pay any extra amount to the shop owners to get the grains. However, more than half of the beneficiaries had never seen the costs of grains displayed on a board in the shop. Obviously, if people are not aware about the costs they were supposed to pay it is unlikely that they will have any complaint about this. One important observation in this context is that many beneficiaries consider payment of an extra amount on account of the cost of transportation cost to be legitimate, not knowing that the transportation cost is borne by the government in the form of a subsidy for transportation. This underlines the importance of having more transparency in the delivery system.

Even if beneficiaries want to complaint, it is not easy. In spite of clear instructions by the government, about 70% shops do not display a complaint book or information about the complaint mechanism. All this gives enough scope for malpractices in functioning of the schemes and thus violates right to food of the marginalized. While these violations are rampant, they go unchecked as the supervisory machinery is mostly non-operative or turns a blind eye to these occurrences.

Food rights activists[2] allege that FPSs sell poor quality grains, a problem that would have increased after distribution of 'red wheat' in the state. Contradictory to these allegations, over 90% of beneficiaries in our study stated that the grains they receive in FPSs are of reasonable quality and match their dietary habits. We suggested that this was possibly because "the beneficiaries were so much in need of the grains to alleviate their poverty and hunger that they could not bother much about the quality of what they received" (Kumar *et al* 2008).

The beneficiaries are often unaware of the standards of quality against which to rate their grains. In spite of government instructions, about three-fourths of the FPSs observed did not display samples of food grains in sealed plastic bags and about 20% of the shops maintain the samples in open bowls, which is violation of

the guidelines. However, it was noted that in spite of their impoverishment and low expectation, 10% of the TPDS and five percent of the Antyodaya beneficiaries rated the grains as of bad quality. In such cases the quality must have been really bad that even the below poverty line population has complaints.

We also asked about beneficiaries' perception of cleanliness and hygiene in the ration shops. About one-fourth of beneficiaries did not find the shop clean and hygienic. "If even the population below the poverty line staying in "kutcha" houses and the poorest of the poor found the shop unhygienic, then that observation warranted the official attention and appropriate action" (Kumar *et al.* 2008).

Food rights activists[2] claim that the shopkeepers keep the beneficiaries' ration cards with them, which can be easily manipulated to facilitate black marketing of the grains. In contradiction to these allegations, our research showed that most of the shopkeepers (about 85%) do not keep the beneficiaries' ration cards with them. However at least in 14% of cases the shopkeepers keep the cards with them, which provides enough scope for malpractices. Violation of food rights of even these 14% has to be understood in the light of poverty, marginalization and vulnerability of the target group. Also considering the total number of card holders which is appozimately 65 lakh, 14% would means about nine lakh beneficiaries in the state are cheated. One can guess the total amount of fraudulent funds and corruption going into this.

Saffron card holders

The Economic Survey of Maharashtra 2008-09 reports that there are one crore forty lakh saffron card holding families in Maharashtra. Saffron card holders are entitled to subsidiezed grain and the state receives allocations for them from the central government. However they receive almost nothing from the TPDS.

The government guidelines very clearly mention that every saffron card holders is entitled to 35 kg food grains a month. However FPS owners and ration officers claim that they do not receive enough grains to supply to all the saffron card holders. As a result, throughout Maharashtra saffron card holders receive almost no grain, and those who do receive something receive much less than the stipulated 35 kg.

Table 6 Utilization of grains (wheat and rice) under APL category

Year	Allocation received from GoI	Amount distributed to district storage centres	Amount picked up by districts from storage	Offtake (amount purchased through FPSs)	Amount not reaching beneficiaries	Percentage reaching beneficiaries[a]
2004-05	4,700,880	2,856,000	50,572	58,974	4,641,906	1.25
2005-06	4,700,880	2,856,000	101,546	124,330	4,576,550	2.64
2006-07	1,948,540	1,948,540	153,690	158,163	1,790,377	8.12
2007-08	176,379	Data missing	101,084	134,796	41,583	76.42

Source: Department of Food and Civil Supplies, GoM, 2009
Figures are in metric tons and include rice and wheat a. percentage calculated of offtake as part of allocation

The data shows that the state was not picking up almost half of the allocations until 2006. The performance at district level was worse than this and lots of gaps are also seen when it comes to offtake at ration shops. The net result showed that almost 98 to 99% of grains allocated for the saffron card holders went unutilized. There is a change in this trend from 2006-07 onwards, where the state is picking most of the grains allocated for APL. However the state quota shows a large reduction. Since the state has shown a trend of underutilization, the central government has reduced the quota to almost 3.78% of what the state was getting four years ago.

Interestingly, the amount of grain purchased through ration shops has been increasing. In fact, the offtake at ration shops is more than the lifting by state. There is definitely strong demand for subsidized grain; beneficiaries are purchasing these grains wherever they are available. However the districts are not picking up their quota of grains.

Recently a newspaper reported that the amount of grains available for each saffron card holder is as less as one gram per person per day (Chitrangada Choudhury, Hindustan Times, Mumbai, June 16, 2008). The recent GR to distribute five kg rice to the saffron card holders (ADP-1508/3263/CS 22) is an indicator of acceptance by the state government of the fact that saffron card holders are not given 35 kg grains they are entitled to.

Ration Shop

FPS owners get a margin of Rs.50 per quintal for distributing grains in TPDS for APL, BPL and Antuodaya beneficiaries. This margin covers the expenditure of running the shop, include maintenance, registration fees, taxes, wages, electricity bills etc. Apart from this margin, the shop owners get a transport rebate based on the distance between shop and godown (ranging from Rs.8.43 to Rs.13.49 per quintal). An additional transport rebate is given to shops in tribal areas and furthermore for shops in remote tribal areas (ranging from Rs.10 to Rs.50 per quintal). In spite of these incentives, many shop owners charge beneficiaries more than the stipulated costs. Approximately half the beneficiaries in our study reported that they have to pay an extra amount to the shop owners to get their grains. Many of the beneficiaries were unaware of the actual prices of grains as most of the shops did not display the costs. With lack of information, "...payment of an extra amount on account of transportation cost was considered legitimate by a number of beneficiaries" (Kumar *et al* 2008). On the other hand, shopkeepers complain that with these rates of margin and rebate they can hardly earn any profit. Lack of profit pushes them towards malpractices like overcharging and black-marketing. In our research and in the public hearings by AAA, shopkeepers expressed a dire need to increase the rate of margin rebate and transportation cost (). This has serious implications especially when the state is planning to handover the ration shops to women self help groups (SHGs).

On 3 January 2006, the state government decided to hand over all the ration shops to women SHGs. FPS owners raised a public cry and also went to court against this decision and obtained a stay order. The state government withdrew the decision and ratified the new order, according to which only new ration shops will be handed over to SHGs (GR dated 3 November 2007). If the level of profit is so low than its quite possible that the SHGs may not be able to sustain the FPSs. The entire system must be strengthened by increasing the margins and rebates and by giving training inputs. It is also important to add more components like door step delivery, which will be necessary to make shops viable and to sustain the system.

Rationing committees

The state has clear guidelines and systems in place to track malpractice in the PDS. Actions are taken against hording and black marketing. Nonetheless, various guidelines issued by the government are openly violated by the ration shopkeepers. There remains great need for a strong monitoring mechanism. The data given in the table shows the number of raids and value of commodities seized.

Table 7 Raids on FPSs

Year	2005-06	2006-07	2007-08
Number of raids	2471	2601	2316
Value of goods seized (Rice, wheat, kerosene)	364,86,37,391	2,96,13,429	6,86,35,094
Number of people arrested	3699	3610	2889

Source: Budget documents of the Department of Food and Civil Supplies, Government of Maharashtra, 2009

However, many food rights activists[2] claim that the raids are just a 'drama' staged by officials which, in no way controls the corruption in system.

To ensure better transparency and accountability and to enable people to monitor the functioning of the system, the state issued a government resolution dated 5 November, 1999 for formation and functioning of rationing committees at the district, taluka, municipal council, municipal corporation and village level. The state budget documents do not mention the functioning of such committees, however information obtained under the Right to Information (RTI) Act showed that the number of committees formed was far below the required number.

Table 8 Formation of rationing committees

Level	Formed	Yet to be formed
District committees	5	28
Taluka committees	91	265
Municipal council	21	203
Municipal corporation	1	59
Village committees	6272	26574

Source: Department of Civil Supplies 2006

Finances

The state government is responsible for making finances available to run these schemes. The subsidy provided for the supply of food grains through TPDS, the cost of maintaining a buffer stock and the difference between procurement prices and issue prices is borne by the state government and collectively called the 'food subsidy'. The entire amount of food subsidy as its share in the revenue expenditure of the

state government has remained around 0.30% in last three years (Economic Survey of Maharashtra, 2007-08), i.e. out of Rs.100 of revenue expenditure incurred by the state the total amount spent on food subsidy is 30 paise. An analysis of state budget documents reveal that the gross domestic product of the state (preliminary estimates) during 2007-08 at current prices was Rs.5,90,995 crore, and the total budget estimate was Rs.85,637.38 crore. The total amount of food subsidy in 2008 was Rs.162.97 crore (RE). The total amount of food subsidy in the state is less than 0.19% of total budget and 0.03% of GSDP (Economic Survey of Maharashtra 2008-09; Budget in Brief 2007-08).

For our research we did a detailed analysis of TPDS and Antyodaya finances and observed that the actual amount spent has always been lower than the budget estimates for the TPDS and Antyodaya schemes. The amount spent on allocations for these schemes was found as low as 34%, 44% and 58% of the budget estimates in the period 2002-05. A vast percentage of the fund allocated for TPDS and Antyodaya schemes was not spent. Kumar *et al* 2008 explain the under-spending as follows:

The situation characterized by this erratic pattern of spending indicates the possibility of either the officials returning the unspent amount to the government or diverting the provisioned amount to some other scheme or project. In either case this was tantamount to a violation of Supreme Court orders regarding the implementation of the scheme.... the notable discrepancy between financial allocation and actual spending presented a negative feature of the scheme implementation namely the lack of sufficient initiative from the policy makers and implementers.

The underutilization of financial resources is a prime example of bad budgeting.

Conclusion

The state government has exhibited an effort to translate the directions given by the Supreme Court into guidelines and resolutions and has passed relevant resolutions. However, when it comes to ground level implementation, the state has left a huge scope for improvement.

On one hand there is a huge quota allocated to state which is not picked up at the district level. The state is also not using the financial resources to the fullest possible extent. And on the other hand we have crores of people whose food rights are violated by not giving them ration cards and excluding them from the ration system. People who have been able to get a ration card have complaints about inadequacy of grains, entitlements not being met, service delivery being weak etc. Fair price shopkeepers do not care to comply with the guidelines issued by the state, making the system extremely ineffective, and thus again violating their food rights. The beneficiaries of TPDS are the most vulnerable people in the state and are at extreme risk of hunger if the state does not take proactive and efficient steps for effective implementation of the schemes. Unfortunately, the monitoring mechanism is almost absent and the lack of transparency in the system makes monitoring extremely difficult. There is great need to revamp the system to be more effective.

Recommendations:

The huge PDS network can play a more meaningful role only if the macro level self-sufficiency in food grain production is translated into micro level self sufficiency in ensuring availability of food for poor households. An effective PDS is a step towards this end.

The faulty definition of poverty line excludes various needy and marginalized people, who are the rightful claimants of the schemes. The process of drafting a new poverty line is moving extremely slowly and there are many concerns about its effectiveness. There is an urgent need to make a new BPL list with logical criteria. The criteria can not be based only on calorie norms but other social disabilities also must be taken into account. Also, there is an urgent need to devise a mechanism to ensure that marginalized groups like primitive tribes, female headed households, rag-pickers, physically handicapped, and commercial sex workers are immediately given the benefits of the Antyodaya scheme as per the government's decision. Implementing the criteria with a 'target' is contradictory and ridiculous. The target system practically means a quota system and calls for an urgent reconsideration to ensure inclusion of marginalized groups.

In spite of clear decisions, the saffron card holders do not get the grains that they are entitled to. Especially in the present context of rising inflation it is extremely important that the state picks up the entire quota it is entitled to and makes sure that it is distributed to the FPSs.

The gap between requirements and allocations is not typical for Maharashtra. States including Tamilnadu, Andhra Pradesh, Karnataka, Madhya Pradesh and Chhatisgarh supplement this gap by adding to the quota through a state government subsidy. Maharashtra can consider a similar scheme by adding to the subsidies.

Stringent action needs to be taken against shopkeepers who do not follow the state issued guidelines and thereby make the system incapable of ensuring food rights of the vulnerable. The negligent and corrupt officers who commit breach of their duty by not monitoring and supervising the shops should also face stringent punishment. Appointment and functionality of all the rationing committees at all levels along with mechanism for participation of food rights activists, CBOs and NGOs, peoples' organizations and the representatives appointed by the Supreme Court advisor must be ensured.

The court has put a stay on the decision to handover all the ration shops to self help groups. The government decided that the licenses to start new shops will be given only to the SHGs. However, in this new order (3 November 2007) the government deleted various important provisions (e.g. door step delivery, distribution centre, etc.) which will weaken the system and make ration shops unviable. This decision needs to be reconsidered and efforts must be made to strengthen the system and make it more viable for the SHGs.

Food rights activists have given various suggestions including roaming ration cards, mobile ration shop, a door step delivery system, a helpline for PDS complaints, and ration entitlement authority slips. The government is implementing some of these schemes. However the performance reporting of these schemes is limited to financial reporting. Outcome budget studies or social audits of these schemes will help us understand their effectiveness. Similarly, research on various issues of concern, such as the specific needs of saffron card holders, beneficiary satisfaction, utilization food grains, recommendations from the beneficiaries, and the feasibility of food coupons, would be helpful to enhance the performance of the schemes.

To ensure and facilitate the implementation of an effective PDS, activists have demanded that the state come up with a state level PDS order in the form of a central government order as occurred in Chattisgargh state.

Strengthening the PDS and exploring the potential of alternative systems requires discussion. A round table conference to discuss different aspects of food security with participation by experts, the food right activists, academics and government representatives would be pertinent effort for this.

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Chapter 5

Implementation of ICDS in Maharashtra

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Mahesh Kamble

Nutrition in early childhood has long enduring effects on children's lives-on their health status, their ability to think, learn, work, communicate, socialise and perform. Good nutrition is important to provide immunity against various diseases in childhood as well as later in life. Poor nutrition in early years can have long-term detrimental effects on physical, psychological and emotional growth and capacities. Lack of proper nutrition does not only harm their capacities as citizens but also damages an individual by increasing health problems through stunted physical and mental growth. And the damage done is by and large irreversible. Only a healthy child can become a healthy adult who can contribute productively towards societal growth.

Adequate nutrition is also a human right, especially for the children. Considering the importance of adequate nutritional food to a child, the state has to play a critical role in ensuring nutrition in early childhood. The state's role must be especially large in a country like India where about one-third population is below the poverty line and lives in hand-to-mouth conditions. Towards combating malnutrition, the Child Rights Convention article 27 (3) expects the state parties to take appropriate measures to implement this right and "...provide material assistance and support programmes, particularly with regard to nutrition..." The constitution of India, article 47, declares that the "...State shall regard the raising of the level of nutrition and the standard of living of its people and the improvement of public health as among its primary duties". It is in this perspective that one must understand the Integrated Child Development Services (ICDS) as one of the most important programmes in the country. This chapter aims to assess implementation of the ICDS in the state of Maharashtra.

The National Family Health Survey III (NFHS III) exposes many shocking facts about undernutrition. In the 'developed' state of Maharashtra, about 25% of women marry before the accepted age of 18 years. Less than half of women of Maharashtra aged 15 to 49 are in the 'normal' BMI category and more than one third of women (36.2%) are 'totally thin'. Almost half of the total female population (48.4%) is anemic. These low levels of female health translate into maternal health issues when women become pregnant. Children are born with low birth weight and pose major challenges for early childhood nutrition. It is important to understand the larger social context in which both poor maternal health and undernutrition in children are perpetuated. The following quotation A Rights Based Perspective (2006) discusses these social factors (Sinha 2006).

...Pregnancy and childbirth are extremely private issues, rarely addressed beyond the circle of concerned women. For instance, if a woman goes to the hospital and there is no doctor, and she delivers under a tree, this does not become an issue of protest in the community. Should an infant die as soon as it is born or a mother die due to excessive bleeding after delivery, there is no expression of shock or outrage. Similarly, if the child is severely undernourished, it is seen as an act of god, resulting from some kind of 'karma'.

Anxious parents who consult doctors spend lots of money and are seldom given proper advice on feeding the child differently. When girls are married at 13 or 14 years of age, there is no debate; this is seen as an accepted norm (Sinha 2006).

Social discrimination against women plays a major role in harming not only their health and nutritional status but also the health of the next generation as well, leading to huge number of malnourished children. NFHS III 2006[2] shows that 38% of the children under age three were stunted (too short for age), 15% were wasted (too thin for height) and 40% were underweight (too thin for age) in Maharashtra.

The ICDS

Responsibility for child nutrition cannot be left only to parents. State intervention is vital to ensure the universal realization of the right to nutrition. India is trying to address the issue of child malnourishment through the Integrated Child Development Services (ICDS). The ICDS was started in 33 blocks in the country in 1975 to provide services to pre-school children in an integrated manner so as to ensure proper growth and development of children in rural, tribal and slum areas.

The objectives of ICDS are stated as:

- To improve the nutritional and health status of children in the age group of 0 to 6 years.
- To lay the foundations for proper psychological, physical and social development of the child.
- To reduce the incidence of mortality, morbidity, malnutrition and school drop-out.
- To achieve effective coordination of policy and implementation amongst the various departments to promote child development.
- To enhance the capability of the mother to look after the normal health and nutritional needs of the child through proper nutrition and health education. (ICDS Maharashtra 2009)

Recognizing the importance of catering to the health and well being of the mother to reduce infant mortality and malnourishment, the programme also focused on pregnant and lactating mothers. Later, after realizing that women need nurturing long before becoming mothers, the programme was expanded to adolescent girls through implementation of the Kishori Shakti Yojana (KSY), which was started in 2000-01. Though the provision of supplementary nutrition to children is the most well-known activity under ICDS, it actually involves provision of various other services, which include:

- Supplementary nutrition to all children below 6 years of age, especially to malnourished children, pregnant women, lactating mothers and adolescent girls
- Growth monitoring
- Preschool education
- Nutrition education for the community
- Immunization and
- Providing referrals to hospitals.

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[2] Nutrition data (2005-2006 National Family Health Survey (NFHS-III) Maharashtra Fact Sheet

These services are provided through a chain of 'Anganwadis' located in villages/ wadis/ padas and communities including slums.

Since its inception in 1975, the scope of ICDS has increased significantly. The Supreme Court of India has played a key role in the expansion of the mandate of ICDS. In the Public interest litigation (PIL) filed by the (People's Union of Civil Liberties (PUCL) v/s Union of India and others, Court Writ Petition (CWP) 196/2001, the Supreme Court in its order dated November 2001 directed all governments to ensure that there is an Anganwadi centre in every hamlet, where every child under six, every pregnant and lactating mother and every adolescent girl is given supplementary nutrition. This was re-stated in the order dated 13 December 2006. The court also has issued various other orders related to coverage of beneficiaries, number of working days, inclusion of scheduled caste (SC) and scheduled tribe (ST) communities, ban on contractors, and allocation and utilisation of finances. However there is great concern that these orders are not being implemented properly. In their reports, the commissioners appointed by the Supreme Court have mentioned that the "...compliance of these orders is far from adequate."[3]

In its common minimum programme, the United Progressive Alliance (UPA) Government had agreed to universalise ICDS to "...provide a functional anganwadi in every settlement and ensure full coverage for all children." Towards this end, the country needs about 1.4 million anganwadis. However in reality, only 1.05 million anganwadi centres have been sanctioned by the Government of India, of which only 0.84 million centres (60% of required) had been operationalised by on 31 March 2007. Recognizing the huge gap between the requirement and actual operationalising of ICDS centres, the Supreme Court of India on 13 December 2006 ordered the government that the rural communities and slum dwellers should be entitled to an "anganwadi on demand" within three months from the date of demand. This provision is applicable in cases where a settlement has at least 40 children under six but no anganwadi. The court does not rule out the possibility of having mini anganwadis for settlements where number of children is less than 40. This order is of a significance importance not only as an important step towards ensuring universalisation of ICDS services but also because it gives power to the people to influence government.

ICDS in Maharashtra

Against the background of Supreme Court orders and assurances given through the Common Minimum Programme, we now move on to assess the implementation of ICDS in Maharashtra. To a large extent, this section draws from the 2008 report titled "Food to the Poor." On the request of the advisor appointed by the commissioner of Supreme Court of India on food rights, a research team[4] was commissioned to explore patterns of implementation of schemes concerned with food rights. The objective of the study was to understand the pattern of implementation of the said schemes to get a picture that was independent of activists and government officials, which could be generalizable to the entire State of Maharashtra. A research study of the grass root implementation of food schemes would better equip the advisor to report to

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[3] http://www.sccommissioners.org/

[4] The research team consisted of Dr. Sharath Kumar, professor at the College of Social Work, University of Mumbai, Mr. Johny Joseph, Director, Creative Handicrafts, a woman's cooperative group, and myself, Mr. Mahesh Kamble, subsequently appointed as a Assistant professor at the Tata Institute of Social Sciences, Mumbai. This study was conducted in eight Districts of Maharashtra, randomly selected on the basis of population norms and administrative divisions and involved detailed observation of ICDS centres and interviews of ICDS functionaries and beneficiaries. The study was published by the National Centre for Advocacy Studies in 2008 as "Food to the Poor: A Study of Implementation of the food related schemes of the Government of Maharashtra".

the commissioner about the situations in Maharashtra. The present chapter draws some important observations and data from the report.

Coverage

There are 451 projects in Maharashtra out of which 297 projects in rural areas, 66 projects in tribal areas and 88 projects in urban slum areas. There are currently 82,625 anganwadis functioning under the ICDS scheme. These centres in total provide supplementary nutrition to 58,14,138 children below six years of age and 10,06,745 pregnant women and lactating mothers. (ICDS 2009)

Maharashtra is far from reaching universal coverage. The existing services fall short of covering the stipulated population.

Total number of anganwadis needed in the state of Maharashtra	140,633
Number of anganwadis sanctioned	84,854 (60.34%)
Number of anganwadis providing supplementary nutrition	82,459

(www.icds.gov.in accessed in June 2009)

Considering population norms, the State of Maharashtra needs at least 42,677 anganwadis in urban areas and 97,956 anganwadis in rural areas out of which 13,855 are required in tribe dominated habitations. The March 2009 status report by the Department of Women and Child Development shows that the total number of anganwadis sanctioned in Maharashtra is 84,854. Out of these, 82,459 anganwadis are actually providing supplementary nutrition to the children. Thus there is a huge gap in requirements and actual provisions of anganwadis. The sanctioned number of anganwadis is only about 60% of the required amount and approximately 400 sanctioned anganwadis are not providing supplementary nutrition to the children.

Maharashtra's implementation gap is one of the highest in the country and also much higher than the national average of 3.96%. Even the so-called backward states of Uttar Pradesh and Bihar have a greater percent of required anganwadis in place than Maharashtra. A shortage of anganwadis means that children and women are compelled to travel greater distances to avail these services. It was seen in our research that at lease one out of every seven potential beneficiaries do not have an anganwadi near their house. This low accessibility has serious implications on availing the benefits of anganwadi centres as the beneficiaries—malnourished children, pregnant women and lactating mothers—cannot be expected to walk long distances to receive supplementary nutrition.

Food rights activists[5] claim that social discrimination is quite evident when it comes to setting up anganwadi centres. Geographically separate groups, particularly scheduled caste (SC) groups, scheduled tribe (ST) hamlets, migrant laborers, and nomadic tribes, are at high risk of hunger and malnutrition yet are least likely to get anganwadi services. The Supreme Court of India has issued directions that anganwadis in all SC/ST habitations across the State open on a priority basis (order dated 28 November 2001) and reiterated this in

[5] Discussion with Food rights activists: Mr Suresh Sawant, Mr Lakshman Dasari, Ms Leena Joshi, Ms Ulka Mahajan

the order dated 7 October 2004. However, there are no evidence that any important steps have been taken towards meeting this directive.

The shortage of anganwadis results in inadequate facilities for supplementary nutrition, which results in rampant malnutrition. The monthly report of ICDS for March 2009 showed that only about 56% of children in the zero to six years age group were normal weight and about 44% of children are malnourished with 9,888 children suffering from severe malnourishment of III and IV grade. If this is the case for the 8.3 million children in Maharashtra who are beneficiaries of ICDS growth monitoring, what is the status of nutrition for the remaining children who are not benefiting from ICDS services? This high rate of malnourishment is cause for serious concern and furthers the case for expansion of ICDS to all the vulnerable groups.

Total population of children below age of six years in the ICDS project areas	83,41,916
Regular beneficiaries of SNP in the areas covered by ICDS projects	58,14,138 (69.69%)

Source: www.icds.gov.in

The monthly progress report of ICDS for March 2009 states that the total population of children below age six in the areas covered by ICDS projects is 83,41,916 out of which 58,14,138 (69.69%) are regular beneficiaries of a supplementary nutrition programme (SNP). This data shows that a huge number of children are still excluded from benefits of ICDS programme.

NFHS III data confirms this shortcoming by showing that 73.54% children staying in areas covered by anganwadis did not get supplementary nutrition. The data shows that supplementary nutrition on almost daily basis is available only to 11.86% children. Incidentally, the random sampling done for NFHS III showed that only a little more than half of the state (57.4%) is covered by ICDS, which is much less than the national average of 72.4%. These NFHS III findings show that the ICDS goal of universal coverage remains distant.

ICDS also provides supplementary nutrition to 10,06,745 pregnant women and lactating mothers. The data does not report the amount of supplementary nutrition given to adolescent girls. This lack on information supports the argument of food rights activists throughout the state that adolescent girls are not benefiting from the ICDS scheme. In spite of orders from the Supreme Court, so far the state government has not made any concrete decision to provide nutrition to adolescent girls.

Infrastructure

The study by Kumar S. *et al* 2008 showed that in spite of having provisions for the construction of a centre, in around half the cases (51.7%) anganwadi programs are being housed in gram panchayats or school premises. Only 27% anganwadis had their own or separate structure. In six cases, the anganwadi centers were located in the house of a villager and in two cases inside a temple. This puts constrains on running the centre for all 300 stipulated days.

An anganwadi is supposed to be a physical structure where the children come for food, play and preprimary education. The centre therefore must have certain basic infrastructural facilities available. The same research

indicated that the physical structure in many cases was in poor condition. It was seen that only 51.7% of the anganwadi centers had physical space available sufficient enough to run both the anganwadi and the nutrition program. Many did not have adequate ventilation (35.6%) and did not have open space (35.6%). Only 58.6% centers had a compound wall. Overall, almost one-third of anganwadi centers in the state did not have proper infrastructure. The dire state of anganwadi centres may be indicated by a lack of drinking water facility in about 39% and lack of toilets in about 69% ICDS centres.

Thus though the scheme intends to provide nutrition to the disadvantaged sections of society, the absence of essential facilities at the anganwadi center indicates poor implementation of the scheme. As the following quotation from (Kumar S. *et al* 2008) suggests, the failure to ensure proper anganwadi facilities reflects an attitude of indifference towards the program by government bodies.

The government ensures ritual status to the scheme, without qualitatively addressing the issues of poverty, malnutrition and integrated child development. As the beneficiaries hailed from the poor segments of society and meekly accepted whatever they received as the benefit, those responsible for the proper and effective implementation of the services tended to become more indifferent and insulated.....(Kumar S. *et al* 2008).

Strong political will and good governance are desperately needed to achieve better implementation of the schemes.

Utilisation of services

The right to food campaign (December 2007) has outlined various problems in food supplies in ICDS, which include "...food supplies are disrupted for months at a time for trivial reasons, such as delays in sanctioning funds or administrative bottlenecks. Irresponsibility and corruption on the part of food supply contractors [who have been banned by the Supreme Court, but continue to operate in many states] is also common. Even where food supply is regular, there is much carelessness in food storage, and the quality of food is poor in many cases (p. 35)."

Government of Maharashtra budget documents show that all the anganwadis were functional and provided supplementary nutrition for all the 300 stipulated days. It means that except Sundays and government holidays, all anganwadis were working. However, the study by Kumar S. *et al* 2008 showed that about 40% of the anganwadis in Maharashtra worked for less than 300 days. Interestingly, when the research team visited the anganwadi centres in Thane District on a pilot visit, three out of four anganwadi centres were closed because it was 'salary day'. The Right to Food campaign Maharashtra (Anna Adhikar Abhiyaan) conducted a series of public hearings across the state[6] in which various food rights activists claimed that anganwadi service is irregular, as many anganwadis do not work on most school holidays, in particular during summer vacation and Diwali vacation.

[6] Presentations in public hearings conducted by Anna Adhikar Abhiyan in different parts of the state.

During the research, we checked entries of food supplies to the anganwadis and found that only 79% of centers had maintained regular entry of food supplied for the 15 days preceding our visits. In the remaining 21% of cases, anganwadis did not make entries, out of which seven centers did not even have a register for recording the same. Extrapolating these findings to the state level would mean that about 14,000 Anganwadis do not make timely entries of food supplies, indicating laxity on the part of anganwadi staff and supervisors.

The same research also showed that the food supplied was fresh in 81.6% of the Anganwadis visited and properly cooked in 78%. In 21% of the cases, the food supplied was not edible and in one third cases not considered tasty. It was found sufficient in 79% cases. Put together, quality of food was poor in 20% of the centers. Extrapolating this data to the whole state would mean that about 15,000 anganwadis in Maharashtra serve poor quality food in terms of being not tasty, not edible, not fresh and or not cooked properly, which means that about a million children who are beneficiaries of ICDS are served poor quality food. However, only 5% of the beneficiaries in the study reported the food quality as poor. This discrepancy may be attributed to lower expectations of the beneficiaries, who come from their marginalized and vulnerable conditions.

Considering the marginalized status of these groups, the beneficiaries are supposed to be given nutritional food without any costs and contributions. However, the research showed that at least one in every six centers took either labour or materials from the beneficiaries for preparing the food. It seems that the anganwadi worker does not have any other alternative as almost a quarter of the anganwadi centers observed did not have enough food stock to suffice for a week. Only one-third of the anganwadi centres reported receiving funds on a regular basis. The government resolution (GR)[7] issued by the state government recognizes the fact that without timely reception of funds the programme will be weakened. In spite of clear guidelines issued by the state government for payment of these expenses before the 10th of every month, irregularities and delays in payments continue. About 89% of the Anganwadis reported that the delay is in the range of two to five months, which is a serious lapse of duty from the implementing officers.

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[7] Various GRs and Notifications issued by the department of Women and Child Welfare, Government of Maharashtra

Experiences of Self Help Groups in providing cooked meal to ICDS

In many villages across the state, the Self Help Groups in the villages have taken up the task of cooking food for children (age group 6 months- 6 years) and other beneficiaries (pregnant women, lactating women and adolescent girls) covered under ICDS scheme. One of the research investigators with SATHI interviewed the women from SHGs to understand how this system is being operationalised at ground level. The discussions highlightes the problems of delayed payment and inadequate funds provided to support the scheme by the Government.

The case studies were conducted in the villages in Thane and Pune district. The SHG in Thane district was providing cooked food to Anganwadi for last two years. The Anganwadi had more than 150 beneficiaries. One of the problems related to providing nutritional supplements to the adolescent girls is that there is a prefixed quota for the number of adolescent girls who can be given food in this scheme. Only three adolescent girls are provided food at a time. However, in reality there are much more girls who need nutritional supplements, thus the supplementary nutrition is provided only for a month to the selected beneficiary. Every month three new girls are selected as beneficiaries. Providing nutritional supplementation just for a month obviously makes no difference to the nutritional status of the beneficiary. This clearly underscores the need to universalise this scheme and ensure that all the needy beneficiaries are provided nutritional supplementation.

There are ten women in the Self Help Group. They cook food in their house and send it to the Anganwadi. Every member cooks food for one month. They said that they get a profit of Rs. 100- 150 each per month. An additional amount of Rs. 500 is given by the Government for the fuel used for cooking the food.

The grocery required for cooking is purchased from the local shop on credit. They need to prepare a bill and submit it to the Anganwadi worker. The amount is then sanctioned by the ICDS officer in Dahanu and money is reimbursed to them. This process takes almost 2-3 months. The Self Help Group has not received the amount for last three months and they have a bill of Rs. 30000 to pay to the local shop owner. The women in the Self Help Group collect an amount of Rs. 50 per month per member. Many times they use money from this pool.

In another village of Pune district, the SHG has taken the responsibility of cooking food for the Anganwadi but because of minimal profit all SHG members do not participate in this activity. The food is cooked by the secretary of the SHG. She also faces the problem of delayed payment because of the lengthy and tedious process of approval. She has to buy all the material on credit till the time she gets the payment from the government. To maximise the profit in preparing food, she compromises on the type of food cooked for the anganwadi. She cooks rice for most of the times and other nutritious food such as sprouted beans or lapshi are provided just once a week.

Staffing

The anganwadi centre is the most important institution to deliver the services ensured under ICDS. The daily routine of anganwadi centres is managed by the anganwadi worker (AWW) with assistance from a helper. To monitor and support their work there is a hierarchy with supervisor, assistant child development programme officer (ACDPO) and a child development programme officer (CDPO) for every project. Unfortunately, many of these positions remain vacant, harming the implementation of the programme. Details of sanctioned posts and vacancies are given in the following table

Table 1 Staffing in ICDS

Designation	Sanctioned posts	In position	Vacancies
CDPO	451	356	95
ACDPO	207	144	63
Supervisor	3,422	2,901	521
AWW	84,854	80,475	4379
Helper	84,854	78,002	6852

Source: (icds.gov.in, March 2009)

In spite of various newspaper reports on severe undernourishment in the state, and in spite of required sanctions, these posts remain vacant. Food rights activists claim that this illustrates the state government's apathy and insensitivity.

The anganwadi worker is the most important functionary in the anganwadi centre. She plays the most important role in spreading awareness about anganwadi services, bringing the children to the anganwadi centre, providing supplementary nutrition, maintaining records, monitoring growth, etc. Almost all anganwadi workers are specially trained, showing that the importance of this post is well recognized. Vacancies in such an important post raise questions about the effectiveness of the entire programme. In the study by Kumar S. *et al* 2008, it was found that on average an anganwadi worker works for around five and half hours a day for six days a week and felt that these working hours were quite long. This feeling might be attributed the honorarium that is paid to them. Most of them (77.6%) were unhappy about the poor pay and more than half of them (55.3%) are not paid their honorarium on a regular basis. It must be noted here that after many demonstrations and agitations, in August 2007, the state government has increased anganwadi workers monthly honorarium by Rs.400 bringing it up to approximately Rs.1800. The anganwadi helper now will get about Rs.900 per month.

Shortages of higher-level staff such as the CDPO are also quite stunning. There is a 20 to 30% vacancy rate in the higher key positions, which are responsible for supervision, management and monitoring of the scheme. Absences at this level implies lack of monitoring mechanism, which was clearly visible in the research by Kumar *et al* 2008. Almost 20% of anganwadi centers in Maharashtra did not maintain an attendance register for the staff and 10% of the anganwadi centers in the state did not keep a beneficiary register. Though more than 90% of centers had a register for recording the details of the supply of

nutritious food, almost half of the centers visited for our research did not have one or more of the required registers. These gaps not only show the absence of appropriate monitoring mechanisms, but also raise questions about the validity of the data given in various government documents and reports.

In spite of the Supreme Court order and government resolution, self-help groups (SHGs) are not involved in supplementary nutrition programme (SNP) in more than two third of Anganwadis studied. In most of the cases, the anganwadi helper herself cooks the food for beneficiaries.

Finances

In ICDS, the expenditure on nutrition is borne by the Government of Maharashtra, while the expenditure on all other components (fuel, constructing a centre, food preparation) is fully reimbursed from the Government of India.

As per the ICDS guidelines every child is entitled for fresh cooked meals of 300 calories and 8-10 grams of proteins, for which the Department of Women and Child Welfare has prescribed Rs.2 per child per day. The norm is little higher for severely malnourished children and pregnant women and nursing mothers/adolescent girls at Rs2.70 and Rs2.30 respectively per beneficiary per day. The Government of Maharashtra uses different norms as 'unit costs'. Accordingly, the rate of 300 calories and 8-10 grams proteins (i.e. one unit) would be Rs.1.50 per child per day. The provision of food to the severely malnourished child and to the pregnant woman and lactating mother is be considered as two units per person per day (ICDS 2005). Thus, compared to the norms prescribed by the central government, the Government of Maharashtra spends less for normal children and more for malnourished children. (It may be noted here that in a very recent judgment in April 2009, the Supreme court has instructed the government to increase these expenditure to Rs. 4 and Rs.5 respectively)

The total expenditure on supplementary nutrition in ICDS in 2007-08 was about Rs.5358 million, which amounts to about 0.65% of the state budget and a mere 0.08% of the gross state domestic product (GSDP). It means that out of every Rs.100 of GDP, the state government spends only eight paise on providing nutritious food to the children below six years, pregnant women and lactating mothers. Considering the fact that ICDS is the only programme catering to the needs of children under six, this programme deserves much more serious attention. In spite of problems in coverage, regularity, and quality of services, such low expenditure on an important programme shows the lack of seriousness and apathy from the government towards one of the most vulnerable population group.

Malnourishment status

Lack of infrastructure and inadequate staffing and finances are leading to inadequate coverage and the underutilization of services. As a result, the children in Maharashtra are under continuous threat of starvation and undernutrition.

The monthly progress report of Maharashtra ICDS for March 2009 shows the following:

Table 2 Monthly progress report of Maharashtra ICDS

	Number	Percentage
Total population aged 0 to 6 covered by ICDS projects	8,341,916	100
Total number of children weighed	7,699,722	92.3
Normal weight	4,675,051	56.04
Grade I underweight	2,505,014	30.03
Grade II underweight	509,769	6.11
Grade III & IV underweight	9,888	0.12

Source: Monthly Progress Report of Maharashtra ICDS March 2009 (www.icds.gov.in)

The data showed that even out of the children in areas covered by ICDS, a little less than 10% of children are excluded even from basic growth monitoring services. Out of those who are getting ICDS services, a little more than half are of normal weight and about one-third face malnourishment of grade one. The number of children with severe malnourishment of grade III or IV is about 10,000. Even in the state capital of Mumbai, only 30% of children are in the normal weight category. Overall, this data shows the alarming status of child nutrition in Maharashtra.

Furthermore, food rights activists argue that these figures are not factual and very misleading. Anganwadi staff do not have proper weighing machines and the government has a tendency of underreporting malnutrition, especially grade III and IV. This underreporting was established in a study by Punarvasan Sangharsha Samiti in Akkalkuva[8]. The researchers of the samiti found 315 malnourished children of grade III and IV in the villages where the government report claimed there were only 34 cases. About 90% of the cases of severe malnourishment were not even reported in government documents. This difference is

[8] Report by Punarvasan Sangharsha Samiti on malnutrition in Akkalkuva

extremely disturbing as the villages are the ones covered by the Navsanjeevani http://www.maha-arogya.gov.in/projectandschemes/itdpnavsanjivani/default.htmscheme of the state government. If the data from villages that are already considered at risk of malnutrition is so flawed, then one can imagine what the situation in other places must be. The report by the Tribal Research and Training Institute (2002) also mentions the government's tendency to deny or underreport severe malnourishment.

Recommendations

The first stage of solving a problem is to recognize its existence. Unfortunately, the government of Maharashtra has turned a blind eye and is denying the severity of the state's child undernourishment situation. First, the government must recognize the gravity of the situation. Detailed empirical research and public advocacy around the issue will pressure the government to admit the seriousness of the issue. It will be possible to implement the following recommendations only when the first step of recognizing the seriousness of the problem is achieved.

Keeping with the goal of 'universalisation of ICDS,' the coverage of ICDS must be expanded to reach out to every child, pregnant or nursing mother, and adolescent girl. The commissioner's report in 2007 cited the results of the NFHS III, which show that the Percentages of malnourished children (under three years) among SC and ST population is much higher than it is among others in the population. It is therefore important that in the process of universalisation of ICDS priority be given to setting up anganwadi centres in SC/ST hamlets and ensuring that every SC/ST hamlet has an anganwadi centre. On 13 December 2006 the Supreme Court issued directions to start 'anganwadi on Demand', where an anganwadi shall be set up within three months when demand is made from a settlement that has at least 40 children under six but no anganwadi. However, the Supreme Court Appointed Commissioner in his report for August 2007 has commented that the procedure drawn by the government for anganwadi on demand is too bureaucratic and complicated. The commissioner has recommended a new, simpler procedure. The provision of additional resources, publication of a vision document, appointment on all the vacancies, creation of new posts, and ensuring involvement of community based organizations (CBOs) and non-governmental organizations (NGOs) are just a few of the steps that need to be taken immediately. The state government must draw an action plan of how it will go ahead with the universalisation of ICDS.

Considering the present situation, universalisation is not enough. What is needed is "universalisation with quality." This would require a range of other steps including adequate and quality training, improved infrastructure, and appropriate cost norms to provide supplementary nutrition, increased community participation, convergence with the Health Department and so on.

The strategy paper on framework for the 11th Five Year plan questions the magic figure of assumed 300 calorie deficit for the supplementary nutrition component of ICDS, suggesting that it needs to be re-examined. The report states: "The 300 calories was most probably calculated based on current weights and not desirable weights, or took into account the child's capacity to consume this amount at one sitting" (p. 15) (Sinha *et al* 2007).The latest National Nutrition Monitoring Bureau (NNMB) data (2006-07)[9] show that even today there is a deficit of over 500 calories in the intakes of one to three year olds and about 700 calorie among three to six year olds. There are bound to be additional multiple vitamin and mineral deficiencies when there is a 40% deficit in calories. This clearly brings forth a need to revise the norm of 300 calories to improve the SNP.

The commissioner's report (Saxena 2001) recommends that the financial allocation be increased to at least Rs.3 per beneficiary per day for children under six, pregnant and lactating mothers and adolescent girls. Furthermore, the allocation for severely malnourished children should be increased to the rate of Rs.5 per child per day. In a very recent judgment in April 2009, the Supreme Court has instructed the government to increase this expenditure to Rs 4 and Rs 5 respectively

Scholars (Sinha *et al* 2007) suggest that the functions of ICDS have to be separated, with a specialised person to provide pre-school education and another trained worker to take charge of the health and nutrition aspects of the programme. She also suggests that there must be coordination between the health and education departments to provide these services efficiently. In addition, the National Rural Health Mission's plan to post community health workers in each village should be integrated with the ICDS programme.

Mothers and children have responded very positively to SNP wherever SHGs were involved in preparing cooked food in anganwadis. To make ICDS a people-based programme, it should involve the SHGs, which are potentially the most effective and active grass-root level action groups. Their contributions can be sought not only in the SNP but also in running the anganwadis. The spirit of community participation and contribution is lacking in anganwadis and people treat ICDS as a government programme rather than their own programme. This impression needs to be altered by involving Panchayati Raj institutions and local community based organizations in the ICDS programme.

Food rights activists have offered suggestions such as keeping anganwadi centres open for the whole day, setting up crèches for younger children and providing take-home rations for those less than three years of age. These suggestions also have been discussed in the commissioner's reports, but no concrete movement towards their implementation has been seen so far. It seems that these suggestions will never be implemented without a 'political will' to implement them, which would be visible through higher budget allocations, better infrastructure, enhanced human resources, closer monitoring, improved accountability, and more active community participation.

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9 www.nnmbindia.org

Decentralisation of all procurement including that of preschool and medicine kits and supplementary nutrition would help not only in checking the large scale corruption and leakages involved in centralised purchases but would also ensure more participation of people and better services through ICDS. The Supreme Court and the commissioner's report has already discussed this; now the government must make a policy decision about the decentralization of ICDS services.

Many child rights activists associate the government's apathy towards this programme with the fact that children are not vote banks. Nutrition as a right of the child must be considered an issue of good governance and therefore a political issue. Increasing the participation of the people in running the Anganwadi centre and ensuring better services is pertinent. NGOs and people's movements have to play a critical role in working towards this.

ICDS targets the most vulnerable and dependent groups in the society. Therefore, laxity in implementation of ICDS must be considered as a violation of the human rights of the most marginalized. There has to be serious debate on conceptualizing and implementing ICDS to ensure better performance. The debate should involve food rights activists, bureaucrats, academicians, and NGOs and must be backed by political commitment from the government and opposition. Roundtable conventions and debates through conferences conducted on solid research would help to build a vision and improve implementation. There is great need for further research on various components of ICDS. This research must be taken up with an action agenda for discussion with the state.

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Chapter 6

Implementation of Mid Day Meal Scheme in Maharashtra

Chapter 6

Implementation of Mid Day Meal Scheme in Maharashtra

Mahesh Kamble

"By subjecting children to hunger, we rob them of their God-given potential. We then deliver them to the schools with one arm tied behind their backs and expect teachers to perform an often-impossible task. This, in turn, results in the waste of billions of dollars we invest in the education of our children because hunger prevents them from getting full value of their educational experience."

Dr J. Larry Brown,
Tufts University

Introduction

Formal education empowers an individual to fulfil his or her needs and aspirations and is the key to overcoming poverty and ensuring rights. Hunger and malnutrition among school-going children can seriously impair cognitive developments. A hungry child finds it difficult to concentrate, study, learn and perform and therefore is at high risk of dropping out of school. Hence, classroom hunger can be a major obstacle in delivering education to poor children. Children who are hungry or undernourished also have more difficulty fighting infection. They are more likely to become sick, miss school, and fall behind in class. Thus, hunger obstructs education by hampering both physical and cognitive growth.

Article 21A of the Indian Constitution assures free and compulsory education to all children from the age of six to 14. The UN Convention on the Rights of the Child, to which India is a signatory, also enshrines the right to education for all children. The Supreme Court of India on several occasions has prescribed that the right to life enshrined in Article 21 of the Constitution of India also implies a 'right to live with dignity', which also includes the 'right to food'.

Against this background, the Government of India started a massive programme to provide mid-day meals to all school-going children. The Mid Day Meal (MDM 2008-09) Scheme is one of the biggest programmes in the country targeting the elimination of classroom hunger.

The Government of India started the National Programme for Nutritional Support to Primary Education in 1995. As per the programme, all school-going students were given a free 'dry ration' (typically three kg of rice) every month to carry home. The programme, widely known as the 'school feeding programme', was an initiative towards tackling the problem of hunger in young students. However, while dry rations helped increase school enrolment, they did not help ensure regular attendance.

A few states, such as Tamil Nadu and Gujarat, began providing cooked midday meals. Midday meals were quite effective as they encouraged children to go to school on their own, without much pressure from

parents. Cooked midday meals served as a positive reinforcement by facilitating regularity in attendance and enhancing learning capacity. Midday meals also made it easier to retain pupils at school after the lunch break, as children did not have to go home for their lunch. Finally, midday meals could play various "socialisation" roles with improved interactions and sensitivity for social and gender justice.

Objectives of the scheme

The mid day meal in its present form was initiated in 2004. According to the scheme every child in a government or government-assisted primary school or in Education Guarantee Scheme (EGS) and Alternative and Innovative Education (AIE) centres as well as madrasahs/maqtabs is entitled to a nutritious, cooked midday meal. Broad aims of the scheme are:

The broad aims of the MDM scheme are:

- Promoting school participation
- Preventing classroom hunger
- Facilitating the healthy growth of children
- Intrinsic educational value
- Fostering social equality
- Enhancing gender equity

Midday meals have an intrinsic educational value because well-nourished children are better able to learn. In addition, midday meals teach children about nutrition, food-related hygiene and proper food preparation. Eating together facilitates the development of important social skills, such as how to share food and food-related tasks (such as fetching water and taking turns tidying up) and how to make appropriate mealtime conversation. The development of these skills in school is particularly important for children living in environments without strong, positive adult role models and for children whose parents are often too busy to take time to eat with them. Serving the same meal to all children, regardless of gender, caste or religion, and encouraging communal eating fosters a sense of equality among children.

Mid Day Meal Scheme in Maharashtra[1]

The scheme in Maharashtra follows a similar system as the central-level midday meal scheme that began in 1995. In its original form, food grains were provided to students if their attendance was higher than 80%. In an important judgement (28 November 2001), the Supreme Court stated: "We direct the State Governments/ Union Territories to implement the Mid-Day Meal Scheme by providing every child in every government and government assisted primary school with a prepared mid day meal with a minimum content of 300 calories and 8-12 grams of protein each day of school for a minimum of 200 days" (Saxena 2001) . Accordingly, the scheme was redesigned in January 2003. Since then, instead of raw grains, a cooked mid day meal—Khichadi—is served to all primary school students (standard I to IV, generally ages six to 10 years) in government and government-subsidized schools.

Since January 2008, the scheme has been extended to cover the upper primary level (standard V to VIII, generally ages 10 to 14) in 45 educationally backward blocks in 10 districts of Maharashtra (Nandurbar, Gadchiroli, Nanded, Hingoli, Parbhani, Jalna, Nasik, Thane, Beed and Kolhapur).

As per the scheme, the students of primary class (standard I to IV) are entitled to a cooked midday meal that will provide them with a minimum of 450 calories and 12 grams of protein. The upper primary class students (standard IV to VIII) are entitled to a cooked meal that will provide them with a minimum of 700 calories and 20 grams of protein.

The mechanism

According to the guidelines issued by the Department of School Education, each student in primary school is entitled to a cooked meal of 100 grams and each student in upper primary school from the educationally backward blocks is entitled to a cooked meal of 150 grams. This meal shall be supplemented with other items such as dal, vegetables, oil, and spices. Children must be allowed to eat their fill. If required, additional resources should be mobilized to increase the quantity of food being cooked. The overall responsibility for implementing the orders rests with state governments. The central government supplies the food grains free of cost, provides transportation allowances, and contributes conversion costs, i.e. expenditure on cooking and adding taste and nutrition.

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[1] On the request of the advisor appointed by the commissioner of Supreme Court of India on food rights, a research team was commissioned to explore patterns of implementation of schemes concerned with food rights. The objective of the study was to understand the pattern of implementation of the said schemes to get a picture that was independent of activists and government officials, which could be generalizable to the entire State of Maharashtra. A scientific research study of the grass root implementation of food schemes would better equip the advisor to report to the commissioner about the situations in Maharashtra, The research team consisted of Dr. Sharath Kumar (professor at the College of Social Work, University of Mumbai), Mr. Johny Joseph (Director, Creative Handicrafts, a woman's cooperative group) and Myself- Mr. Mahesh Kamble (subsequently appointed as a Assistant professor at the Tata Institute of Social Sciences, Mumbai). This study was conducted in eight Districts of Maharashtra, randomly selected on the basis of population norms and administrative divisions and involved detailed observation of distribution of Mid Day meals and interviews with functionaries and beneficiaries of Mid Day meals. The study was published by the National Centre for Advocacy Studies in 2008 as "Food to the Poor: A Study of Implementation of the food related schemes of the Government of Maharashtra". The present chapter draws some important observations and data from the said report.

In addition to providing free food grains, the central government also provides states/union territories (UTs) with assistance towards cooking costs (Rs.1.50 per child per day for primary and Rs.2.00 per child per school day for upper primary).

The central government also provides assistance to states for:

- Transportation of food grains from Food Corporation of India (FCI) godowns to schools
- Management, Monitoring & Evaluation (MME) of the scheme
- Construction of kitchen sheds
- Central assistance for providing cooked midday meals during summer vacations to children in drought-affected areas.

Coverage

Maharashtra's budgetary data[2] shows that in 2007-8, about 8.132 million primary school students were beneficiaries of the MDM scheme, out of which about 15% were scheduled caste (SC) and 12% were scheduled tribe (ST). About 48% of MDM beneficiaries were female students.

Considering that the total number of students enrolled in primary education in Maharashtra is 11.688 million, about 14% of the students are still excluded from the benefits of the MDM scheme. Additional research confirms these findings. Sharath Kumar *et al.* 2008 found the exclusion rate to be in the range of 15% for the previous three years. The budgetary data shows that there are at least 3842 primary education institutions which do not provide midday meals to their students. The scheme also does not address to the food security of about 100,000 children who do not attend school.

From 1 January 2008, the government decided to provide midday meals to upper primary schools in educationally backward blocks. Within one month of this notification, 2441 institutions had started serving midday meals to upper primary schools while 754 schools had not yet begun. In 2008-09, the state government is likely to provide midday meals to 4 million upper primary school students.

Utilisation of food grains

As mentioned earlier, the food grains for midday meals are allocated by the central government while the state government picks up the grains from central godowns and distributes them to the schools through the public distribution system (PDS). The following table shows the data for allocation and pick up of food grains for the MDM scheme.

[2] Information accessed from www.maharashtra.gov.in

Table 1 Year wise allocation and pick up of food grains for MDM in MaharashtraYear*

	Allocation by the national government to Maharashtra (Quintal) **	Amount picked up from godowns and distributed to MDM scheme (Quintal) **	Amount not picked up (Quintal)**	% of food not reaching MDM scheme
2003-04	2,235,868	1,836,986	398,882	17.84
2004-05	2,223,033	1,505,348	717,685	32.28
2005-06	2,078,097	1,502,513	575,584	27.70
2006-07	1,641,352	139,444	1,501,908	91.50
2007-08	18,01,220	1,546,686	2,54,534	14.13

*Fiscal year is April to March **Quintal = 100 KGs

Source: Budget documents of Food and Civil Supplies Department 2007-08

The table shows that there is a consistent pattern of underutilization of food grains allotted for MDM. It shows that almost one third of the grains allotted to the state were not picked up and the scheme has been continuously underperforming. Shockingly, in 2006-7, only 10% of the allocated food grains were picked up, which seems to be compensated for in the following year. This pattern of underutilization might be the reason why the central government has reduced the allocation by almost four to six lakh quintals in last four – five years. Especially in 2006-07, both allocations and utilisation of grains is extremely low. Both grain utilization and the amount of food picked up from godowns are showing downward trends, i.e. the state government is picking up less and less grains every year.

The guidelines of the scheme clearly state that the provision for each child is up to 100 grams per day and the scheme must run for 200 days a year. However, allocation for 2005-6 was about 1.5 million quintals of grains, with which only 7.5 million students can be provided midday meals as per the guidelines. The state claims that 8.2 million beneficiaries are being served under the scheme. This claim means either that the state is not providing meals to all beneficiaries or that the meals provided are not adequate, (i.e. are less than 100 gram per student and/or are not provided for 200 days a year). And this seems to be the pattern of implementation over period of time. The observed underutilization of grains coupled with the decreasing trend confirms the findings of Kumar *et al* 2008 who also noted significant drop in the distribution of grains.

It is impossible to run the MDM programme without grains. The state's failure to pick up the grains allocated to it by the central government is a serious concern. It raises doubts about performance of the scheme.

Fund utilisation

The financial data for the MDM scheme was collected from the Department of School Education, and reveals several serious issues.

In 2006-07, the state contributed Rs.980 million to the MDM scheme and received about Rs.2000 million from the central government, making the total funding available Rs.2980 million. Of the total amount available, Rs.2830 million was used while Rs.150 million was not utilised.

In 2007-08, the state received Rs.3410 million (Rs.2530 million from the central government and Rs.880 million from the state contribution) towards the conversion cost. Out of this, the state used only Rs.1450 million up to the month of December. Thus there was a remaining balance of about Rs.1960 million that the state was to spend in next three months. The budget reports also revealed that the actual availability of conversion cost was about Rs.1.15 per student per day (as opposed to the stipulated Rs.1.50 per student per day). The schools are likely managing by not adding essential nutrients and ingredients that add to the taste of food.

Thus, the scheme finances show a pattern of underutilization of funds and confirm Kumar *et al* 2008's finding that the state utilises only around 60% of the available funds. By analysing various GRs issued by the Department of School Education[3], the same research also showed that the decision to revise the conversion cost from Rs.1.00 to Rs.1.50 per student per day was not implemented, even in 2006[4], one year after the decision was made. This 2005 decision to increase the conversion cost had been postponed at least thrice. During this time the government kept using the unspent balance from previous years to run the scheme. The fact that the government had left over funds each year illustrates that the funds were unutilised and that the scheme was not functioning as it should.

In the Union Budget of 2007-08, Rs.73, 240 million was provided for the scheme, representing a 37% increase over the budget for 2006-07.

Implementation of the scheme

Anna Adhikar Abhiyan (AAA) Maharashtra[5], did a detailed study on the implementation of MDM in Maharashtra. Findings of this study are available at Infochange dated December 19, 2008. According to this survey, in 87% of the villages studied, facility for primary education was present within the village itself. However, only 12% of villages schools were distributing cooked food to school children. Most of the schools distributing food only cooked rice without any other supplements such as cooked dal and vegetables. In the majority of remaining villages, where cooked food was not being provided, three kg of rice per student per month was given. Less than one-third of villages studied had 100% coverage of the scheme. A positive finding however was that the supply of food grains was quite regular for the villages.

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[3] Information accessed from www.maharashtra.gov.in

[4] Information accessed from www.education.nic.in/mdm

[5] Presentations in public hearings conducted by Anna Adhikar Abhiyan in different parts of the state.

Even where cooked meals are provided, they do not meet the nutritional requirements stipulated by the Supreme Court. In not a single village studied were children getting food equivalent to 300 calories and eight to 12 grams of protein. In the majority of villages, the quality of food was average. Quality was reported to be poor in one-fourth of the villages and only one village was found to be providing good quality food.

All villages are supposed to publicly display translated copies of the Supreme Court orders that pertain to the MDM scheme and are also supposed to display a list identifying the beneficiaries of the MDM scheme. However, translated copies of the Supreme Court orders were displayed in only in nine percent of village gram panchayats, school buildings and public distribution shops (PDSs). The list that identifies beneficiaries of the MDM scheme was displayed in the gram panchayat in only 8% of villages. The lack of publicly displayed court orders and beneficiary lists shows a need for greater transparency in the entire process of MDM. If people do not know their entitlements they obviously can not claim their rights.

Kumar *et al* 2008 study noted similar issues about poor implementation of the scheme. The study showed inadequacies in regularity of the supply of food to the students and supply of finances to the schools. More than one-third of the schools had to use someone's house for cooking and 27% had to cook in open spaces. Only five percent of the schools had received some amount of money to construct a kitchen. In 19.5% of the cases, the teachers had to spend their own money to purchase utensils. Nearly one-third of the schools did not have enough utensils. Almost one-forth of schools reported that they did not have a drinking water facility. In about one-third of the schools studied, no teacher or other adult in charge tasted the food before serving it to the students. Less than four percent of the schools served local food and more that one-forth of the schools studied always served the same menu. These shortcomings underline the need to implement the scheme in an innovative way in order to ensure that the students have adequate access to edible and enjoyable food.

The Kumar *et al* 2008 study also analysed the teachers' perceptions of the MDM scheme and the problems faced in the implementation of the scheme. Overall, teachers had a very positive perception of the scheme. While commenting that the scheme must continue to serve food to the students, most of the teachers (84%) agreed that the attendance level in the school had increased considerably and that MDM had brought about an improvement in the health of the children. This shows the importance of having such a scheme.

However, the study raised doubts about peoples' participation in the scheme. In about half of the schools studied, the parents or SHG or Mahila Mandal did not take any interest in the functioning of the midday meal scheme nor did the village education committee members monitor the implementation of the scheme.

Recommendations:

The underutilization of funds and grains show that the scheme is not really treated with due seriousness. The government must ensure that all the grains allocated to the state from the central government are picked up from central godowns and utilized for the benefit of the great number of schoolchildren who need them. Simultaneously, considering the huge number of students who are not benefiting from the scheme, there is a dire need to increase coverage of the scheme. The government might need to collaborate with NGOs to increase access to MDM.

For the scheme to be successful, a strict monitoring system with the participation of the people needs to be put in place.. Inclusion of Mahila Mandal and SHG members as well as the inclusion of students' representatives in these committees must be seriously considered.

There are issues of transparency in the implementation of the scheme. Data related to MDM ought to be uploaded onto the internet and made available to the public, as has been done by other states and other schemes.

The Commissioners of the Supreme Court have recommended a *minimum* national norm of Rs.2 per child per day for cooking costs, with the central government and state government contributing equal amounts (Rs.1 per child per day each). Andhra Pradesh and Tamil Nadu are following this by contributing Rs.1 per child per day towards cooking costs in addition to the contribution of the central government. This is a minimal norm, and needs to be adjusted to account for rising prices. The Maharashtra government contributes only fifty paise, which is less than the prescribed norm and needs to be revised. Apart from financial contributions, it is important that state governments 'own' the midday meal scheme and back it fully. It is this involvement and political backing of the state government that makes midday meals much more successful in some states than others.

With a little creativity and imagination, locally available foods can add nutrition to the midday meals at minimum cost in most parts of the country. Processes like sprouting, fermenting, using iron vessels and adding the edible leaves of vegetables can be used to enhance the nutritional value of common foods. These are very simple processes at little or no extra cost. Items such as pulses, green leafy vegetables, sprout lentils, eggs and milk, and fruits such as bananas can be added to the meals provided in MDM, and more attractive and varied dishes (such as dhokla, dal bhaat, dalia, kheer) can be made. No single vegetable, fruit or grain contains all the essential nutrients. Efforts need to be made to make the meals as varied, interesting and wholesome as possible. Variety in the meals also helps to ensure that the children eat well throughout the week. Since food resources and dietary patterns vary a great deal between different areas, a locally planned menu will be more acceptable to students. Consultation with the local community, parent teacher associations, women's self-help groups and nutrition experts can be helpful to plan an economical, varied and nutritious menu.

A 'school health scheme,' which include growth monitoring, micronutrient supplementation (e.g. iron tablets), immunization, and deworming, as well as dealing with common ailments and conducting dental or eye checkups, will be useful to look at health of school going children in a holistic manner. Ensuring adequate drinking water and clean functional toilets for the students are further important aspects to ensure better health.

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Chapter 7

Undernutrition, Ill- Health and the Role of the Health System

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Chapter 7

Undernutrition, Ill-health and the Role of the Health System

Amita Pitre

Introduction

The previous chapters have adequately discussed that undernutrition is a huge and persistent problem in Maharashtra, resistant to half hearted measures. This chapter emphasizes the contribution of undernutrition to morbidity and mortality, the primary concerns of the health care system. Not only does undernutrition play a major role in increased mortality and morbidity in developing countries but the vicious cycle of undernutrition and ill-health reinforce each other. To illustrate, maternal undernutrition results in low weight babies further susceptible to continued growth retardation. Undernourished girls among the children would go on to become undernourished mothers themselves, unless steps are taken to prevent this. At another level, low birth weight babies and undernourished children are more susceptible to infections, and infections and undernutrition reinforce each other. Undernourished adults are also more at risk of infections, particularly well substantiated by the prevalence of tuberculosis among them. At the same time weight loss is also a consequence of Tuberculosis.

The health system has an important role to play in preventing undernutrition and breaking this vicious cycle. It cannot be disputed that undernutrition is first and foremost a socio-economic and political problem, and remedies to highlight the state's poor performance at the policy level is of the utmost importance. On the other hand, the role of the health system has not been adequately underlined and health professionals too are often found to 'pass the buck' when it comes to tackling this problem. Public health measures such as universal ante natal and maternity care, early detection and treatment of undernutrition, supplementary nutrition, prevention of infections by adequate sanitation, safe drinking water and immunisation and timely treatment of infections cannot be over emphasized in preventing perpetuation of under-nutrition. This chapter will draw attention to the role of the health system in breaking the vicious cycle of undernutrition.

The chapter begins by outlining the burden of morbidity and mortality linked to undernutrition, primarily in the context of maternal and child health, but also others. It then accounts for the mechanisms through which the vicious cycle of undernutrition perpetuates itself. Applying calculations of maternal and child morbidity and mortality to the state of Maharashtra, an attempt is made to calculate the number of child deaths, apparently due to infections but which can be attributed to undernutrition and failure of public health. These are avoidable deaths and healthy years of life lost. They can also be termed as 'excess' deaths attributable to malnutrition. It then moves on to outline measures which need to be undertaken to break this vicious cycle.

Undernutrition and maternal health

Maternal undernutrition is linked to maternal morbidity and mortality in developing countries. Common causes of maternal mortality are post partum bleeding, post partum infections, obstructed labour and ruptured uterus, hypertensive disease of pregnancy and eclampsia. Two common underlying causes of increased risk for mother's health in pregnancy are anaemia and short stature, which work through post-partum bleeding and increased risk of cephalo-pelvic disproportion requiring a caesarean section, respectively. These two factors account for 20% of maternal mortality. (Black *et al.* 2008).

The table below gives a fair idea of nutritional status of women in Maharashtra and India.

Table 1 NFHS III data on Women's and Mother's Nutrition

	Maharashtra	India
Women whose Body Mass Index is below normal	32.6%	33 %
Anaemia among ever-married Women	49%	56.2 %
Anaemia among pregnant women	58%	58 %

Source: NFHS III

Considering a maternal mortality ratio of 130 for Maharashtra (SRS 2004 - 2006 http://www.mohfw.nic.in/NRHM/State%20Files/maharashtra.htm#hp), and 20% maternal deaths on account of anaemia and short stature, about 26 maternal deaths per 100,000 live births are due to maternal undernutrition. This translates into ***480 'avoidable' maternal deaths per year*** in Maharashtra, due to just these two factors. Maharashtra is 30 points behind the United Nation's Millennium Development Goal of maternal mortality ratio of less than 100. Among other measures, improving the nutrition status of women in general and pregnant women in particular, may very well bridge this gap.

It would also be worthwhile to remember that a majority of the brunt of this under-nutrition is borne by women in lower socio-economic classes and vulnerable groups such as SC and ST.

Linkages between maternal factors to childhood undernutrition

Body Mass Index[1] (BMI), which is the ratio of the weight in kilograms to the square of the height measured in metres, is a good overall measure of adult undernutrition. Review of literature shows that low Body Mass Index is an indicator of poor maternal health. Maternal undernutrition also affects the health of the offspring and is responsible for intra-uterine growth retardation (low birth weight, LBW) and increased mortality for the child especially in the neo-natal period (Black et al. 2008). In a retrospective cross-sectional study conducted among pregnant women in a referral hospital in Tanzania, it was found that women with a BMI below 18 proportionately contributed to the highest number of LBW births (17%), followed by underweight women (BMI 18 to 22) who contributed 15.5 % of LBW births. Mothers who did not receive

[1] BMI = weight (kg)/height^2 (m^2)

ante natal care (ANC) contributed more than twice as many LBW births (28.6%) as those who received ANC (13.8%), (chi2 = 8.8; P = 0.01). Anaemia is one more condition among others contributing to high LBW births.

Analysis of NFHS III data (2005-06) from India done by Subramanian et al. shows that maternal height is inversely proportional to child mortality and anthropometric failure among children aged 0 to 59 months. Adjusting for other demographic and socio-economic factors it was found that a 1 cm increase in mother's height was associated with a decreased risk of child mortality, underweight, stunting, wasting and anaemia (Subramanian *et al.* 2009). Children born to mothers who were less than 145 cm in height were 1.71 times more likely to die (95% CI, 1.37-2.13) compared with mothers who were at least 160 cm in height.

Evidence from countries undergoing rapid nutrition transition shows that the poor not only suffer disproportionately from undernutrition, but often bear the double burden of undernutrition as well as obesity (Monteiro et al 2004). LBW and undernutrition in early life contribute to stunting and to metabolic responses towards energy conservation, often leading to obesity and hypertension especially among the poor. Monteiro, Conde et al found that in the period between 1989 and 1997, obesity increased from 7.9% to 12.6% for the low income women, but it decreased from 14.1% to 10.9% for the high income women. The total prevalence of undernutrition and obesity- a proxy for the full burden of nutritional diseases- was larger for the low income women. (Monteiro et al 2004). Thus the poor often bear the double burden of undernutrition as well as obesity. A secondary data review undertaken in Brazil, showed a high prevalence of hypertension (21%) among stunted adolescents. The same study showed a high prevalence of hypertension among undernourished pre-school children (29%) and children recovered from undernutrition (20%) as compared to controls (2%). The prevalence of hypertension was 44% among stunted women and 18% among stunted men (Sawaya et al. 2005)

Linkages between undernutrition and child mortality

Studies from developing countries provide methods to assess the burden of 'avoidable' child mortality or mortality attributable to undernutrition. (Pelletier et. Al. 1995) devised a method based on the results of eight prospective, community based studies of the relationship between anthropometry and child mortality. The studies took place in the rural areas of Bangladesh, India, Indonesia, Malawi, Papua New Guinea, and Tanzania and found that "the risk of mortality increases at a compounded rate of 5.9% for each percentage point decline in weight-for-age below the reference point of 90% weight-for-age" (Pelletier 1995, 443-8). When this method was applied to representative data on weight-for-age from 53 developing countries, it was found that 56% of child mortality could be attributed to aggravation of condition due to undernutrition.

More recent review of literature undertaken by Johns Hopkins University (2000) points to at least 50% of child deaths due to undernutrition. The "strongest and most consistent relationship" was found in diarrhoea and acute respiratory infections and an increase in probability of malarial death also attributed to undernutrition (Rice 2000, 1207-21).

Another review of literature undertaken by Emory University, Atlanta found that children less than 5 years with mild-to-moderate undernutrition were 2.2 times more likely and children with severe undernutrition

were 6.8 times more likely to die following an infection in comparison to their better nourished counterparts (Schroeder and Brown 1994).

A hospital based retrospective study with a systematic sample of 1573 children less than 5 years old, in Burkina Faso (2002) found statistically significant linkages between moderate and severe undernutrition and mortality in the hospital setting. 87% of deaths were statistically attributable to severe malnutrition[2] and 64.3% of deaths were statistically attributable to moderate malnutrition[3] (Savadogo et al. 2002).

In the meta-analysis conducted by Black *et al.* 2008, they conclude that the number of global deaths and disability adjusted life years (DALYs)[4] in children less than 5 years old attributed to stunting, severe wasting, and intrauterine growth restriction constitutes the largest percentage of any risk factor in this age group. Together they globally cost 21% of DALYs in under-five children (totally 2.2 million DALYs). Vitamin A and Zinc deficiency cost 0.6 and 0.4 million DALYs respectively. As mentioned above, these are avoidable deaths and healthy years of life lost, in other words 'excess' deaths.

Linkages between undernutrition and child morbidity

Undernutrition adversely affects host defenses against many invading microorganisms and several aspects of immunocompetence, thereby increasing the severity of infection (Louria 2007; Chandra 1993). Infections are a common reason for families to bring undernourished children to health facilities. Severely undernourished children are more likely to have major illnesses such as broncho-pneumonia, oedema, diarrhoea, pulmonary tuberculosis, septicaemia and meningitis. (Hossaini and Dodd *et al.* 2009)

Well nourished children, on the other hand, have reduced incidence and severity of infections. Analysis of NFHS II data on anthropometric measures of children under five reveals a strong correlation between three attributes: undernutrition or what the authors call anthropometric failure (AF), lower Standard of Living Index (SLI) and increased episodes of diarrhoea, severe diarrhoea and acute respiratory infection (Nandy *et al.* 2005). The authors describe not only the standard categories of underweight (only) (prevalence 5.9% in dataset), stunting (only)(10.1%) and wasting (only) (2.6%) but also describe composite categories of wasting and underweight (6.1%), stunting and underweight (27.9%) and wasting, stunting and underweight (7.2%) among children. The children, who fall under none of these categories, either single or composite, are treated as the reference group. Using these indictors, the authors found that overall undernutrition levels (59.8%), were higher than those found using conventional methods (47.1% underweight) Children with all three failures fared worst off in risk of infection as compared to two failures and these fared worse than those with a single AF. Children with multiple failures were twice as likely to have severe diarrhoea than reference group children. Among children with only a single AF, the underweight children had a higher risk for severe diarrhoea.

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[2] Weight for Age Z-score<=-3

[3] WA Z-score<=-2

[4] A DALY is roughly one lost year of healthy life.

Adult Infections and Undernutrition

As with children, adults with undernutrition are also more prone to sickness. A prospective cohort study among adult population was conducted in Mumbai, India to study the association of relative body weight, as estimated by body mass index, with mortality. After adjusting for potential confounders, significantly increased mortality was observed in all under-weight categories, both for men and women. Extremely thin (BMI<16 kg/m^2) cohort members were at highest risk for death by tuberculosis, cancer and respiratory diseases. (Pednekar et al. 2008) Among adult infections pulmonary tuberculosis (TB) is most consistently linked to undernutrition, depleted weight, muscle mass and body fat. (Pakasi *et al.* 2009; Barr *et al.* 2001; Onwabulili 1988; Harries *et al.* 1988). Treatment of TB also improves nutritional status but this may take a long time even after completion of treatment. In addition, poor nutrition parameters are also strong predictors of poor outcome and greater risk of complications such as acute respiratory failure (Kim *et al.* 2008).

Concept of Excess Deaths due to undernutrition

Around 50 to 56% of under-five child mortality in developing countries, as seen above, can be attributed to commonly occurring childhood infections including diarrhoea, acute respiratory tract infections including pneumonia, measles, other vaccine-preventable diseases and malaria. (Rice *et al.* 2000; Pelletier *et al.* 1995). These infections are not only preventable by public health measures such as provision of safe drinking water, sanitation, immunisation and vector control but are also amenable to timely treatment. Most importantly, their underlying cause is undernutrition.

Well nourished children facing similar environmental risks of pathogens fare much better. Similarly, undernourished mothers run a higher risk of ill-health and death in child birth than well nourished women. Other adults too are at greater risk of morbidity and early mortality on account of undernutrition. Every attempt should be made to prevent these excess and un-necessary deaths as also to document them as such.

Unfortunately, clinicians continue to attribute infections or complications as causes of death, without mentioning the underlying cause i.e. undernutrition. This is widely seen in documentation of causes of death. Such an approach allows policy makers to discount these tragic deaths to infections rather than undernutrition.

To recapitulate the data discussed above:

- 20% of maternal mortality is due to underlying undernutrition
- 50 to 56% of child mortality can be attributed to underlying undernutrition,
- Each percentage point decrease in weight-for-age below 90% of reference range is responsible for a compounded 5.9% increase in risk of mortality among children
- Adult infections such as tuberculosis are also strongly linked to undernutrition
- Undernutrition increases the probability of early death in adults

Excess Morbidity and Mortality in Maharashtra

The crude birth rate in Maharashtra is 19 (CBHI 2005) and the population of Maharashtra is 100 million (CBHI 2000-01). This means that approximately 19 lakh children are born in Maharashtra every year. The child mortality is 47 per 1000 live births (NFHS III 2005-06) and thus the total under number of children under five years who die each year is 89300. Of these, 50 to 56% die due to undernutrition, as discussed above. In absolute numbers this is approximately 45000 child deaths. Also, around 480 women die in pregnancy and childbirth due to undernutrition related causes each year. These can all be considered excess deaths in Maharashtra.

Vicious cycle of undernutrition

Undernourished and stunted mothers tend to give birth to low birth weight children who are at high risk of undernutrition and stunting themselves. This is the intergenerational cycle. At the same time, the low standard of living associated with undernutrition may not allow families the resources, time and facilities to effectively combat undernutrition. Resources such as education, information, time for working mothers to exclusively breastfeed, finances, crèche and supplementary feeding facilities near work-place are limited for those with low SLI. Such undernourished children are at high risk of infections and untimely death. Infections in turn lead to loss of appetite, lack of absorption of nutrients, loss of growth-spurt, leading to further underweight and stunting. On the other hand, especially after the illness is over, children have an increased need for food, primarily to 'catch-up' with their growth and also to replenish their reserves. This calls for a diet over and above the normal intake of the child. Initially well-nourished children can be pushed towards undernutrition in this phase and already undernourished children may find it very difficult to get this additional ration. Thus undernutrition leads to increased infections, which in turn keep the child undernourished.

This is very well demonstrated by analysis of data from North-East Brazil (Guerrant and Schorling 1992). They found that diarrhoea is both a cause and effect of undernutrition. Diarrhoeal illnesses hinder growth by interfering with height and weight gain in children. Repeated episodes of diarrhoea do not allow for the greater assimilation of nutrition that generally takes place in the 'catch-up' growth phase after the infection and after severe undernutrition. At the same time, undernutrition is responsible for 37% increase in frequency and 73% increase in duration of episodes of diarrhoea. Black *et al.* (2008) in their analysis have confirmed that infectious diseases are important determinants of stunting, with diarrhoeal infections having the greatest impact. The adjusted odds of stunting at 24 months of age increased by a factor of 1.05 (odds ratio 1.05, 95% CI 1.03–1.07) with each episode of diarrhoea in the first 24 months.

High risk approach vs. the population approach

In India, severe undernutrition and death has attracted attention and generated political pressure while mild and moderate undernutrition have been more or less ignored. The most striking finding in the study by Pelletier *et al* (1995) is that 83% of 'excess' child mortality which can be attributed to undernutrition is due to potentiating factors of mild-to-moderate undernutrition as opposed to severe undernutrition. Figures vary for each country and in countries such as Bangladesh and India 73-74% of **excess child mortality** (i.e. 73-74 % of 56%, i.e. 41%) is attributed to mild-to-moderate undernutrition (Pelletier *et al* 1995). Schroeder and others (1994) also found that mild-to-moderate undernutrition nearly doubles the risk of children

under-five years dying of infections. This is important because in Maharashtra nearly half the children are undernourished and a majority of them fall in the mild-to-moderate category.

Epidemiologists have long argued that the more common a health risk is in a population, the more likely it is to be normalised as a population trait (Rose 1985). It is difficult to detect the role of common health risks in causing disease and death in studies within the same community, and almost impossible to advocate vigorous measures to change the trait. Mild and moderate undernutrition as a health risk is so common in children under five years of age in Maharashtra that localised studies will not be able to show the causal impact on morbidity and mortality. The 'normalising' of such undernutrition retards appropriate response from the health system. It is only when undernutrition becomes 'severe' that the political and health systems go into overdrive. Children are often hospitalised, fed through parenteral routes and then sent back to the same poor socio-economic and public health milieu which bred the undernutrition in the first place.

In absolute numbers, there are far more people suffering from mild and moderate undernutrition than severe undernutrition. In addition, the contribution of this mild and moderate undernutrition to child mortality and morbidity is much higher than that of severe undernutrition. These less severe grades of undernutrition are also more amenable to home based and community based solutions such as supplementary feeding, nutrition education and early diagnosis and treatment of underlying conditions. The high risk approach tries to prioritise intervention in cases at the greatest risk of morbidity (in this case those with severe undernutrition). The population approach tries to intervene at the level of every member of the community (in this case, all pregnant women, children under five and other vulnerable groups at risk of undernutrition) to prevent the development of high risk situations in the first place.

The health system should take cognisance of the nutrition status of each person, especially every child, adolescent and woman, and take vigorous action in the early stages of undernutrition. This is also an opportunity to build healthy and low cost community approaches to promote nutrition of the population as a whole.

Proportion of morbidity and early mortality due to mild to moderate undernutrition

As we saw above, there are approximately 45000 'un-necessary' under-five child deaths in Maharashtra. 74% of these deaths are due to mild and moderate undernutrition and the rest due to severe undernutrition. In absolute numbers this percentage translates to around 33300 'excess deaths' due to mild and moderate undernutrition, about 40% of the under five mortality in Maharashtra. About 26% of undernutrition related mortality i.e. approximately 12,000 deaths can be attributed to severe undernutrition. While deaths directly caused by undernutrition should invite vigorous remedy, it is important to direct as much, if not more energy to tackling mild and moderate forms.

Role (not) played by the health system

The health care system has a major role to play in preventing undernutrition, promoting better nutrition and treating underlying causes of illness. Unfortunately, the health system, whether public or private, does not seem to be geared to play this role. There has been severe criticism of the Indian medical education system for failing to adequately train doctors to combat undernutrition (Ramani and D'Souza 2006). This failure

stems from the lack of social perspective and understanding of ground realities given to doctors. The basic medical graduate, and thus the primary health care system by extension, is not equipped to diagnose and treat undernutrition at the primary health care level. To give an example, doctors are expected to weigh every child either brought to the health centre or seen in outreach situations and ask appropriate questions to assess the nutritional status of the child, irrespective of the reason for which the child is seen. With extremely high levels of undernutrition in India, every visit to the doctor or of the doctor must be taken as an opportunity for early diagnosis of any growth faltering. Unfortunately, doctors and health personnel more often than not fail to take this opportunity.

The Reproductive and Child Health (RCH II) program has introduced nutrition rehabilitation centres (NRC) for grade three and four undernutrition in most of the 18 high focus states. This program is a prime example of how the health system steps in to identify and treat severe undernutrition but plays little role in mild to moderate undernutrition. The Ministry of Health and Family Welfare seems to have little coordination with the Department of Women and Child Development under which the ICDS scheme is run, though attempts are being made in this direction. Some states with high undernutrition, such as Bihar, Uttar Pradesh, Jharkhand and Chhattisgarh, are yet to initiate even the NRC programme.

Micronutrients or food intake?

Another area where considerable research resources have been spent is on documenting micronutrient deficiencies. Supplementation of crucial micronutrients such as vitamin A, iron and zinc, contribute to reduced incidence and severity of infections. Vitamin A is shown to be beneficial in infections in older children and zinc supplementation shows better outcome in diarrhoea and respiratory infections (Tomkins 2000).

Despite the importance of macro and micronutrients in improving health outcomes, disproportionate emphasis on micronutrient supplementation may deflect attention from the socioeconomic realities of those suffering from undernutrition. Furthermore, it may obscure the most important treatment for these illnesses rooted in undernutrition: nutritious and plentiful food. A study undertaken in Haryana detailing micronutrient deficiencies in undernourished pregnant women noted that nearly 20% of these women consumed less than 50% of recommended calories (Pathak et al. 2004). Their frequency of eating micro-nutrient rich foods (pulses, vegetables, fruits, nuts and oil seeds, and animal foods) was especially low (Ibid). The World Health Survey, 2003 conducted in Maharashtra corroborates low intake of above mentioned food groups. The same study found that only about two in five infants under four months are exclusively breastfed, and only 31% of those aged six to nine months are being fed solid and mushy foods (World Health Survey 2003). Researchers have concluded that Maharashtra has growing food insecurities and the brunt is borne by the marginalised and vulnerable communities (Roy et al. 2004). Health professionals need to acknowledge this problem and respond accordingly. Supplementation of Iron and Folic acid and Vitamin 'A' during pregnancy and for very young children is important for three reasons- one is to break the inter-generational effect of undernutrition, second is due to increased needs in pregnancy and third because these are entitlements as part of the government health programme. Nevertheless, supplementation is no substitute for adequate provisioning of food and nutrition education to women and communities.

Prevention

The first step in breaking the intergenerational vicious cycle is to provide ante-natal care to all pregnant women, thereby improving their nutritional status and consequently that of their unborn child. About one third of ever-married women in Maharashtra have a BMI below normal. As seen in the earlier section of this paper, nutritional supplements in pregnancy, especially iron, folic acid and vitamin A have a substantial beneficial effect on increasing the weight at birth of the child and breaking the vicious cycle of undernutrition as also reducing maternal mortality. Vegetarian diet in India is a poor source of iron, partly because the phytates in the cereal based diets bind dietary iron, reducing its absorption. Since a substantial proportion of Indian women are vegetarians, adequate iron supplementation is needed even in non-poor vegetarian women during pregnancy and lactation. Unfortunately in Maharashtra, in spite of 75.3% women having had three antenatal visits for their last birth, only 30.5% consumed iron and folic acid for 90 days, which is the minimum desired (NFHS- III 2005-06). Data collected from health centres proves that paucity of iron and folic acid supply suggesting that it is a lack of supply, not demand that leads to inadequate intake (Wankhede 2001). The health system seems to have lost the first opportunity to prevent undernutrition. In fact, anaemia in pregnancy in Maharashtra was found to have increased from 53% in NFHS II in 1999 to 58% in NFHS III in 2003. Also, the current package of ANC care does not distinguish between mild, moderate and severe anaemia. In fact, the dosage of 100 tablets of iron and folic acid are meant only to prevent anaemia and more tailor made solutions need to be available for anaemic mothers, based on proper diagnosis.

Table 2 Comparison of indicators regarding ANC and infant nutrition between Maharashtra and India

Indicator	NFHS III percentage	
	Maharashtra	**India**
Pregnant women who consumed iron and folic acid tablets for 90 days	30.5%	22.3 %
Number of children aged 12- 35 months who received a dose of vitamin A in last six months	32%	21 %
Children under three years who were breastfed within one hour of birth	51.8%	23.4 %
Children less than 6 months who were exclusively breastfed	53%	46.3 %
Children between 6 and 9 months who receive semi-solid and solid food and breastmilk (weaning)	47.8%	55.8 %

Source: NFHS III, Maharashtra State

What works (Lancet, 2008 Maternal and Child Undernutrition Series)	• Supplementation of iron and folic acid in pregnancy to improve haemoglobin count at term to a mean 12g/L • Promotion of breast-feeding has a large effect on survival, but small effect in reducing stunting

Nutrition education and supplementation

The boxes titled 'What works' refer to the scientific evidence about the efficacy of nutrition education and supplementation that health professionals can advise. Nutrition education is crucial both for primary prevention and to prevent mild and moderate undernutrition from exacerbating. The health system today only deals with severe undernutrition. It is treated more as any other emergency health problem, rather than with the understanding that this is the culmination of a complex set of economic and social disadvantages, resulting from chronic hunger and starvation. Lack of this understanding often results in the prescription of expensive tonics and vitamin supplements (Amdekar 2002), but no nutrition education to families and effectively returns the child to the same environment. (Amdekar 2002) Much would be achieved if initial stages of undernutrition would be tackled not by medicalising the condition, but by nutrition education and appropriate complementary feeding. Providing nutrition education should also become standard practice with health practitioners, along with other measures to bring more wide-spread awareness.

What works (Lancet, 2008 Maternal and Child Undernutrition Series)	• Counselling about breast feeding • Where food availability is sufficient, nutrition education on complementary feeding increased height-for-age Z score by 0·25 (95% CI 0·01–0·49) • Where food is scarce, supplementary feeding programmes, and conditional cash transfer schemes reduce stunting

Prevention of infections to prevent and arrest undernutrition

An important means to prevent and/ or arrest undernutrition is also to prevent infections. Immunisation, sanitation and provision of safe drinking water are key measures for the same. The table below clearly shows poor achievements on this front.

- Immunisation: only 58.8% of children between 12 to 23 months are fully immunised in Maharashtra according to NFHS III (2005-06)
- Safe drinking water: only 76% of households in rural areas have access to safe drinking water (World Health Survey , 2003)
- Sanitation: only 19% of rural households have access to sanitation (World Health Survey, 2003)

Growth monitoring and follow up as a tool to prevent undernutrition

'Growth monitoring' is an integral part of primary health care and has been incorporated into the Integrated Child Development Scheme. The basic aim of this strategy is to plot the growth curve of every child and take necessary steps when the growth slackens, i.e. the first signs of undernutrition. But growth monitoring as a 'stand alone' tool is ineffective in combating undernutrition (Gopalan, 1987; Bryce *et al.* 2008). Growth monitoring, as put very succinctly by Gopalan back in 1987, is certainly not the end in nutrition improvement, but it is not even the means for better nutrition. At most it is a means to a means. Growth monitoring makes sense if it is linked to immediate action by way of nutrition education, appropriate

feeding, and follow-up from the health system. In the early stages of growth faltering, nutrition education may suffice, while if it is not found to be working then the doctor needs to step in to diagnose and treat any underlying conditions. Mild and moderate undernutrition must be considered the first signs of trouble and vigorous action must be undertaken to bring the growth back on track. Unfortunately, Gopalan's criticism that the ICDS has lost its linkages with the health system, and elaborate measures for growth monitoring are being considered an end in itself or to segregate children in categories of mild, moderate and severe for administrative purposes but not necessarily linked to action, still ring true. These are among the chief reasons for the limited success of the ICDS and other efforts to combat undernutrition.

Curative role of health system

The current health system in India faces problems of inadequate supplies and under-treatment in the public health system and over-medicalisation and excess prescription in the private sector. None of these sectors seem geared to curing childhood infections. To give an example, of the 77.8% of children suffering from diarrhoea in the last two weeks who were taken to the health facility, only 37.8% received oral rehydration solution (NFHS III). Quick and effective primary health care, preferably at the community level, training of public as well as private sector general practitioners in effectively managing childhood infections, and adequate supply of these drugs in the public health system are essential to tackle the menace of under-nutrition. Besides effectively treating other underlying causes of undernutrition (deficiencies, helminths/ worms, metabolic and digestive disorders) and undernutrition it self is an important task of the health system.

What works (Lancet, 2008 Maternal and Child Undernutrition Series)	• Deworming in children showed improvement in weight as well as height • Intermittent preventive treatment for malaria improved birth weight of newborns as well as reduced anaemia in pregnancy • Management of severe acute malnutrition according to WHO guidelines reduced the case-fatality rate by 55% (risk ratio 0.45, 0.32–0.62)

Tuberculosis treatment should factor in the provision of nutritious food, linkages with PDS and ICDS schemes and nutrition education, besides appropriate treatment. Health systems need to ensure that undernourished children and adults are screened for tuberculosis. Long term nutrition support must be coupled with short term drug-based treatment.

Conclusion

The responsibilities of the health system in contributing to preventing and combating undernutrition have not been adequately emphasized so far. Gaps are seen at several levels: medical training and orientation of health professionals, inadequacies of health systems including human and financial resources, medicines, outreach and community services, lack of monitoring and feedback mechanisms to know whether programmes are effective. Above all, in the public health programmes as well as in the interventions by private practitioners, there is inadequate recognition of the direct linkages between infections and

undernutrition and perpetuation of the vicious cycle of ill-health, undernutrition and ill-health. This paper has tried to make those linkages explicit.

More than 20% of maternal mortality and 50 to 56% of child mortality is due to underlying causes of undernutrition. Each percentage point decrease in weight-for-age below 90% of reference range for children compounds increase in risk of mortality by 6 times. Thus the health system needs to take its share of the responsibility to combat under-nutrition by a variety of strategies in their domain. Chief among these are prevention, treatment and control of infections, provision of ante-natal care, immunisation and appropriate care of childhood and maternal health complications. Another important strategy is nutrition education, coordinating with the ICDS scheme to make growth monitoring and supplementary feeding more meaningful, and availing every opportunity for early detection and treatment of undernutrition. It is up to the health system to play a crucial role in breaking the vicious cycle of undernutrition and putting a stop to shameful and unnecessary deaths. But this would require a lot of changes in the health care system itself! Unregulated private practice; lack of accountability of the public health system and on an average sub-standard care in both sectors continue to be major problems in India, Maharashtra. This issue however, is a matter of separate deliberation.

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Conclusions to Report on 'Nutritional crisis in Maharashtra'

Conclusions to Report on 'Nutritional crisis in Maharashtra'

The existence of widespread, debilitating undernutrition across various sections of the population in Maharashtra is not an issue that is peripheral or incidental to the supposedly 'successful' model of economic growth being pursued. It is not an issue of lamenting that some unfortunate people are being 'left behind' while we celebrate and promote high economic growth rates. Rather it is an inevitable, indicting manifestation of the pattern of 'predatory growth' being followed in the state and at the national level. It is a predictable outcome of 'exclusionary development', where large scale hunger and malnutrition continues due to the exploitative logic of corporate growth, which is precisely based on supply of cheap agricultural products and cheap labour based on minimal living standards, to feed a peculiar form of 'development'. It is the logical outcome of a system where the goal of production is to maximise profit for a few rather than to satisfy basic human needs for all, a system which seems to relegate to lowest priority the most basic human need of all – the need for food.

In such a context, it is obvious that the social action which is required to change this situation must be both deep-rooted and far-reaching. Tinkering with a few schemes here and there is not likely to qualitatively change the situation of 'Nutritional crisis' in Maharashtra described in this report. Action focused at just one level, such as improving supplementary nutrition for children, while being necessary would also not be sufficient. The challenge is to qualitatively transform people's livelihoods and food security, and the functioning of nutrition and health related services in an integrated manner so that hunger and malnutrition, and their attendant adverse health effects, would progressively and permanently disappear.

In the early 21st century, with all required knowledge and expertise being available, and in a state like Maharashtra with high growth rates and relatively high per capita income, elimination of hunger would appear to be a straightforward task. However we need to keep in mind that this has not actually happened despite a plethora of schemes during the past decades. To achieve eradication of hunger, technical quick-fixes will not be sufficient; rather this is integrally linked with larger processes of social justice and redistribution. *In the absence of political will and social organisation for such comprehensive processes, isolated technical attempts to improve specific schemes may make some dent but would not be sufficient to eliminate widespread hunger and malnutrition.*

Keeping this in mind, while summarizing various chapters of this report, we would proceed with the framework that ensuring a basic living income and food security for all members of the population is a matter of social justice, a core objective of any model of development, and a basic human right. These comments may be used as an input by academics involved in research in areas which influence food security and nutrition, by activists working on social-economic issues and programmes whereby nutrition of people would be improved, and by decision makers interested in changing policies to strengthen peoples' rights to food security and nutrition.

A. Current scenario - Nutritional crisis in Maharashtra

The first chapter details, with a broad range of data, the depth and seriousness of the problem of undernutrition in Maharashtra. A lifecycle approach is taken, and undernutrition is traced across generations and age groups. Starting with the time of birth, it is noted that in Maharashtra **35 to 40% of newborns are low birth weight**, while if we look at infants (the first year of life), **thirty percent of the infants are**

underweight i.e. they are suffering from both acute and chronic malnutrition. This 'undernutrition at birth' is an inevitable manifestation of large scale maternal undernutrition. Looking at the nutritional status of under five children it is seen that **nearly half (46.3%) of children below five years of age are stunted** while one in five children are severely stunted. In the tribal population, the proportion of severely stunted children is very high at 30%. Similarly, one third children in the lowest wealth quintile are severely stunted. In Maharashtra **only 31% of the children in the 1-3 years age group are able to consume the recommended daily allowance (RDA) of both calories and proteins.** Further a large proportion of children (42%) get enough proteins but insufficient calories, while one in four children get both the calories and proteins in insufficient quantity. **In the age group of four to six years, only 27% consume adequate calories and proteins. Nearly two third (63%) of children are suffering from some grade of anaemia,** where 22% have mild anaemia, 40% have moderate anaemia and around 2% have severe anaemia.

Looking at adolescents **in the age group of 10 to 12 years, only 23% of boys and 25% of girls consume both calories and proteins in adequate quantities.** In the age group of 13 -15 years, only 27 % of boys and 35% of girls consume sufficient calories and proteins. The **girls in the age group 10 to 12 years consume only 14% of the RDI of green leafy vegetables** and one fifth of the RDI of milk and milk products. This is the age of onset of menstruation and every month, there is loss of iron during menses; hence, it is very important that girls in adolescent age group consume enough iron; however this is lacking in case of most adolescent girls. It is not surprising that around two-third of adolescent girls were found to be anaemic.

To complete nutritional assessment across the lifecycle, when we look at adults in Maharashtra, we find that **one third of adults are underweight with BMI less than 18.5 kg/ m2.** Of the adult population in Maharashtra, **15.5% of men and 17% of women have BMI less than 17.0 kg/m2 indicating that they are severely undernourished.**

More women (36.2%) than men (33.5%) are undernourished and on the other hand more women than men are overweight. Out of the total population of women, 50% of are suffering from either the problem of underweight or overweight. **Intake of iron is grossly deficient among women, being at only half the recommended quantity.** Adults are consuming only a third of the recommended intake of vitamin A. The nutritional status of adults is directly correlated with economic status. As the wealth index goes up, undernutrition reduces. **More than 50% of men and women in the lowest quintile are chronically energy deficient and about one-quarter of adults are severely undernourished.** Although the percentage of the undernourished population reduces as we go up the wealth ladder, the proportion of undernourished men and women is significantly high even in the highest wealth index group; almost one fifth of the population is undernourished in this category. Actually the population in the highest wealth quintile is not nutritionally healthy; rather it is showing evidence of nutritional transition where the number of women in the undernourished group is roughly equaled by the number in the overweight group.

Differences in nutritional status based on location of residence are also quite stark: **almost 46% of women in rural areas are thin as compared to 27% in urban areas.** Across caste categories, the **levels of malnutrition are highest among adivasi women, with more than 50% of these women having a BMI less than 18.5 kg/m2.**

Looking at anaemia, according to NFHS III data we find that **almost half of all women in Maharashtra are suffering from some type of anaemia,** which is very significant since anaemia is one of the leading

causes of maternal mortality. The NNMB survey shows even higher levels of anaemia at nearly 70% in women and male anaemia at almost 50%. As in case of BMI, as economic class improves, levels of anaemia decrease. However, *as wealth increases, the gender difference in anaemia levels also increases.* The **highest rates of anaemia are among tribal women,** where almost 60% are suffering from anaemia and there are the highest rates of severe anaemia. Among men also, tribal men have higher anaemia rates than men in other categories.

When we look at nutrition of women during pregnancy, we find that on the average **pregnant women were consuming about 1500 kcal, which is only 70% of the Recommended Dietary Intake.** Similarly, **pregnant women are consuming only one third of the required amount of calcium and iron,** which are essential minerals. When these women become mothers, naturally their babies 'inherit' malnutrition, completing a lifetime cycle of deprivation.

If we look at time wise trends regarding prevalence of malnutrition, we find that **there has not been much progress in reducing chronic undernutrition in Maharashtra during the past decade**. Between NFHS II (1998-99) and NFHS III (2005-06), there has been only a two-percentage point drop in levels of severely stunted children and only a three-percentage point drop in levels of stunted children. The only indicator that has reduced by a considerable extent is the percentage of underweight children; there were almost 12% fewer underweight children in 2005-06 than in 1998-99. Between NFHS II and III, the levels of anaemia among ever-married women have gone up instead of decreasing over the period; although the increase is marginal, it indicates the failure of the state to address this crucial issue.

When we compare Maharashtra with other states, we find that **only one-sixth (16%) of the households in Maharashtra get enough calories and proteins; this is only half compared to the pooled proportion for nine major states (30%)** indicating a much worse situation in Maharashtra than in other states. Average consumption of cereals and millets in Maharashtra is 329 g / CU / day whereas the recommended dietary intake is 460 g / CU / day. With a recommended calorie intake of 2400 Cal. per day in rural areas and 2100 Cal. daily in urban areas, **in Maharashtra only 1647 calories per Consumer Unit per day were being consumed** which is less than 70% of the requirement in rural areas and below 80% of the requirement in urban areas.

The prevalence of moderate anaemia among children in Maharashtra at 40% is almost the same as the national average, is higher than the prevalence in Orissa and double of the prevalence of moderate anaemia in Kerala. In Maharashtra, 36% women are chronically energy deficient which is double the proportion for Kerala and slightly higher than the national average.

In short, despite Maharashtra having one of the highest per capita incomes in the country and being considered one of the most 'developed' states, the bodies of children and adults tell us a completely different picture – of a major nutritional crisis and massive social inequities which undermine all the claims of 'development' and 'growth'.

B. Overall model of inequitable development and inequities in food consumption

The second chapter, "Socioeconomic Inequities in Maharashtra," discusses the state's dire economic and social realities, providing the context for the report's following chapters. Here the current prevailing notion of Maharashtra as a prosperous and rapidly developing state is critically questioned. Despite impressive economic growth, Maharashtra's poverty levels have been similar to national levels, and are currently actually higher than the all-India average, and urban poverty is on the rise. **Over half of the state's population relies on agriculture but this key sector accounts for only 12% of the state's income.** *High rates of farmer suicides and rural indebtedness indicate the inequitable nature and high social costs of Maharashtra's urban-centric corporate development.* In this context, the issues of continuing poverty, agrarian crisis and gender inequities are inextricably linked to the state's nutritional crisis.

Chapter three, "Nutrition Inequalities in Maharashtra," examines the nutritional crisis from the angle of food consumption rather than anthropometric nutritional indicators. It presents data on calorie, protein, fat, and cereal consumption, submitting it to a rigorous analysis though desegregation by caste, class, gender, religion and region.

As noted in chapter two, the problem of insufficient nutrition again has both breadth and depth. Adivasis, Dalits and rural people have the highest rates of calorie and protein deficiency. However, alarmingly high percentages of the non-tribal population and urban population also have insufficient nourishment. Disaggregation by religion reveals that Muslims and Buddhists fare significantly worse than 'Others' (Sikhs, Jains and Zoroastrians) in terms of calorie, protein and fat consumption. The relatively well off coastal region (Konkan) of Maharashtra, in which Mumbai is located, has the lowest urban calorie, protein and cereal consumption among various regions.

Chapter three's analysis of trends since 1993 in calorie intake finds that overall per consumer unit calorie consumption has been dropping for wealthier classes and stagnating for poorer classes. While a reduction in calorie consumption for the rich can perhaps be attributed to more sedentary lifestyles, it is worrisome that the poor, many of whom continue to engage in heavy physical labour, are consuming at low levels. Maharashtra's economic progress seems to have served the wealthy minority but has left the poor majority to continue struggling with food insecurity.

C. Food security and Public Distribution System

The state has in place systems to ensure access to foodgrains in the form of the Targeted public distribution system (TPDS) and Antyodaya scheme. However, these systems are consistently failing the populations they are meant to serve. The state needs to review these programs and create better accountability structures to pressure those in charge to perform their tasks properly.

Chapter four discusses Maharashtra's TPDS and Antyodaya scheme. In 1997, the Government of India introduced the current targeted approach to essential food and commodity distribution (rice, wheat, sugar, oil and kerosene). This approach means that Indians are grouped into four categories, based on income, and that these categories are entitled to graded amounts of food subsidy at respective levels. The poorest of the poor get the most highly subsidized food through the Antyodaya system; Below Poverty Line (BPL) card holders (annual income below Rs. 15,000) get subsidized foodgrains; Above Poverty Line (APL) families

(with an annual income above the BPL cut off of Rs.15,000 but less than Rs.100,000) are entitled to minimal subsidies while the remaining population (i.e. the middle and upper class) are supposed to buy their foodgrains at market rates. This chapter details the many ways that the current TPDS and Antyodaya very frequently exclude people who desperately need subsidized food, and points out how avoidable these failures are. First, these schemes are failing to accurately categorize people based on their need for subsidized food. *The use of very low pre-determined quotas for BPL identification cuts out a large proportion of food insecure people from accessing the appropriate ration card.* The BPL cut off level is unrealistically low and leaves millions of people in the APL category despite their desperate need for BPL-level food subsidies. This is proven by the fact that **the actual per person calorie intake commensurate with the current poverty line in Maharashtra works out to just 1625 calories in rural areas (far below the norm of 2400 Cal.) and only 1618 Cal. in urban areas (much below the norm of 2100 Cal.)** Hence although the official poverty line identifies only 30% of rural and 32% of the urban population as poor, actually **even taking a per consumer unit criteria which is lower than the Planning commission norm*, 54% of the population in rural areas and 40% of the urban population in Maharashtra is found to be calorie insufficient.** If we take the NSS norm of 2700 cal. per consumption unit, we find that an even higher proportion of 68% people in rural areas do not receive this required amount. If we take a lower norm at 2430 Cal. (90% of 2700) per consumption unit for urban areas, then 58% of urban households are not being able to consume this amount.

Further, the Maharashtra state government is failing to pick up most of the food for TPDS and Antyodaya that the national government has allocated and dropped off in godowns. Over 90% of those in the APL category are buying their food at the market rate because the Maharashtra state government fails to pick up the food allotted for sale to APL card holders.

Even the food that makes it from godowns to Fair Price Shops is not easily accessible to Antyodaya and BPL card holders. Most shopkeepers cannot earn enough through honest trade and so make it hard for beneficiaries to access their entitlements, enabling the shopkeepers to sell a part of their quota on the open market. Inconvenient opening hours, turning away people unable to purchase the whole month's ration at once, saying the shop does not have enough foodgrain, and charging a fake surcharge for transportation are all tactics that reduce the accessibility of TPDS and Antyodaya entitlements. Accountability and complaints mechanisms are almost completely ineffective.

D. Nutritional supplementation programmes

Chapter five discusses the Integrated Child Development System (ICDS), revealing several areas where it fails the children, adolescent girls and mothers of Maharashtra. ICDS aims to improve child development by providing nutritional supplementation (to children under six, pregnant and lactating mothers and adolescent girls), immunization, growth monitoring, preschool education, nutrition and health education and health care referrals. Most ICDS activities are to be conducted through Anganwadi centres, including the provision of daily meals; these norms have been recently revised by the Supreme Court, recommending that children are entitled to food supplement of 500 calories of energy and 12-15 gm protein per child per day.

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* Planning Commission had arrived at poverty lines that would ensure a per capita per day requirement of 2400 caloric in rural and 2100 caloric in urban India. In Chapter 4, the calculation has replaced the per capita norm of the Planning Commission with a consumer-unit norm but retaining their limits of 2400 calories in rural and 2100 calories in urban areas, which leads to a lower norm.

Despite Supreme Court orders that ICDS should reach universal coverage, the scheme's coverage in Maharashtra falls drastically short of this ideal. Only 54% of the Anganwadi centres needed are currently fully operational. In Maharashtra, the scheme almost completely neglects programming for adolescent girls. National Family Health Survey III (2005-06) data shows that even in areas covered by Anganwadi centres, 74% of the children still are not regular beneficiaries of nutritional supplements. Food supply to centres is irregular and often disrupted for months. Many Anganwadi centres do not have their own space, despite budgetary allotments for the construction of a proper centre. Anganwadi facilities are overwhelmingly inadequate, with most lacking drinking water, toilets, or compound walls. Approximately a quarter of the staff needed to run and supervise these centres have not been hired.

Chapter five also points out a worrisome inconsistency between Government documentation and real-world realities. While the Maharashtra budget shows that all Anganwadis are up and running and providing food 300 days per year, an independent study by food rights activists Kamble, Sharadkumar and Joseph in 2008 found that 40% of the Anganwadis visited worked for less than 300 days. ICDS reports show that 90% of children coming to Anganwadi centres are weighed and that only 0.16% are severely underweight. However, an independent study by Punarvasan Sangharsha Samiti in Akkalkuwa in Nandurbar district found that many Anganwadi centres lack accurate weighing equipment and consistently underreport malnutrition. In villages where the ICDS reported finding only 34 severely underweight children, the independent researchers found 315, i.e. ***over nine-fold under-reporting of severe malnutrition***. Such incongruity between government reports and reality remind us to rigorously question reports and redouble efforts to put in place independent accountability mechanisms.

The report's sixth chapter, which critically assesses the Mid Day Meal (MDM) Scheme, again illuminates how the lack of accountability and political resolve have severely weakened a program with great potential. Under the MDM scheme all school children are entitled to a nutritious, cooked midday meal at school. This meal is supposed to fill a nutrition gap of 450 calories and 10 grams protein for children in lower primary school and 700 calories and 20 grams of protein in upper primary school. The program has also been extended to secondary schools in 10 educationally needy districts. The Union government provides the food grains free of cost, pays for their transportation and contributes an additional Rs.1.50 per lower primary school child and Rs.2 per upper primary school child to be spent on cooking costs and supplementation of grains with dal, vegetables, cooking oil and spices. Chapter six argues that Rs.1.50 and Rs.2 is not enough to add sufficient vitamins and minerals to the meals and, in addition, shows that the actual amount available per child falls far short, coming to about Rs.1.15 per child. Furthermore, chapter six illustrates that tragically, the state of Maharashtra is failing to pick up over 60% the food grains allocated to the MDM scheme from government godowns and transport them to schools.

As in chapter five, independent research calls into question government reports of scheme coverage and functioning. The Food rights campaign network in Maharashtra - Anna Adhikar Abhiyan (AAA) found that only 12% of the villages studied were actually distributing cooked meals to school children. Among those distributing food, most were only providing cooked rice without any added supplementation.

Broadly, this report's chapters on food provision schemes in Maharashtra highlight how low official priority and lack of accountability is depriving millions of people of much needed nutrition.

E. Health implications of undernutrition and role of the Health care system in dealing with undernutrition

Chapter seven discusses the immense amount of illness and early death caused by undernutrition and suggests ways that health professionals can contribute to combating this entirely preventable morbidity and mortality. Undernourished children and adults are more likely to fall ill and are less likely to survive these bouts of illness:

- 20% of maternal mortality is due to underlying undernutrition
- In developing countries, 50 to 56% of child mortality can be attributed to underlying undernutrition
- Adult infections such as tuberculosis are also strongly linked to undernutrition; undernutrition increases the probability of early death in adults

Since undernutrition is the underlying cause of approximately 53% of under-five mortality in developing countries, this translates to around 45,000 child deaths per year in Maharashtra attributable to undernutrition. Anaemia and short stature—both linked to poor nutrition—among pregnant women account for 20% of maternal mortality. Hence, in Maharashtra about 480 of the 2850 annual maternal deaths can be attributed to underlying undernutrition.

Mild and moderate undernutrition among under-five children is extremely common and this tends to be 'normalised' with inadequate response from the health system, which focuses attention only on severely undernourished children. However it should be noted that in countries like India and Bangladesh, **nearly three fourths (73-74%) of excess undernutrition related child deaths are attributable to mild-to-moderate undernutrition**. It is only when children with Grade IV undernutrition manage to reach health facilities that the Public health system goes into overdrive; however greater attention needs to be given to the entire spectrum of undernutrition, from mild to moderate to severe, instead of 'normalising' the widespread less severe grades of malnutrition which have serious impact in terms of morbidity and mortality.

Despite undernutrition being the root cause, medical professionals tend to attribute deaths and bouts of illness in Maharashtra each year only to the immediate causes, such as bleeding during or after childbirth or bacterial infections. In doing so, they ignore or mask the role of food insecurity in causing immense suffering and death. Mild to moderate cases of malnutrition are especially easy to overlook, despite their causing the vast majority of morbidity and mortality. Health professionals in Maharashtra must be oriented and monitored to ensure that they document and make explicit the link between undernutrition, illness and death; they must energetically prompt action on the first, in order to prevent the latter two adverse outcomes. To rephrase Rudolf Virchow, physicians and health workers must act as 'attorneys of the undernourished'.

F. This report seeks to remind readers of the great toll that undernutrition takes on the people of Maharashtra and points to the hollowness of the neo-liberal model of 'development' being followed, which is unable to significantly reduce widespread hunger despite sustained high growth rates. It is time to raise deeper questions and to move for social and political change at multiple levels, to place equity and redistribution centre-stage, to make access to decent livelihoods the primary goal of the economy, and to ensure the right to food for all citizens of Maharashtra.

SATHI

(Support for Advocacy and Training to Health Initiatives)

SATHI is the action-centre of Anusadhan Trust with headquarters in Pune. The SATHI team init its work in 1998 as an action team in CEHAT and has now evolved into an autonomous centre. The principles of SATHI's functioning are social relevance, democratic mode of functioning, ethical conduct social accountability.

SATHI dreams of a society,

- which has realized its right to health and health care; a society which has eliminated h inequities, by removing the structural barriers which today prevent the majority from acces healthy living conditions and quality health care;
- which instead of the current pathological model of development, has adopted a developm path which fosters health of both the people and their environment;
- where people are not appendages of the health care system; are its prime movers and universal access to appropriate health care as a human right.

To move towards this dream, ***SATHI's mission*** is to contribute to the building of the movement 'Health For All' through collective action and research.

In collaboration with like minded organizations, ***SATHI has set the goal of*** achieving the Righ Health Care for all Indians; as a big step towards achieving 'Health For All'

SATHI's strategy is to contribute, as a team of pro-people health professionals, to the health move and to various initiatives which foster health rights.

Presently SATHI's core activities are-

a. Collaborative health initiates with like minded NGOs and People's organisations in Maharas and Madhya Pradesh.
b. Training related to community health worker programmes and health rights initiatives.
c. Research on inequities in access to health care, availability of essential medicines.
d. Action research on specific issues related to health advocacy.
e. Advocacy at broader level for Primary Health Care and Health Rights.
f. Publication of relevant training and advocacy material on health issues.
g. Library and information services.

Further information about SATHI may be accessed at – www.sathicehat.org

A Report on Nutritional Crisis in Maharashtra

This report on 'Nutritional Crisis in Maharashtra' attempts to unravel the links between socioeconomic inequities and nutritional inequities in the state of Maharashtra.

The first chapter of the report, '***Undernutrition in Maharashtra, a situation of crisis***,' is a situation analysis of malnutrition in Maharashtra. This chapter demonstrates the disparities in nutritional status of the population on the basis of their residence, gender, caste and class. The chapter also provides a comparative picture of undernutrition in Maharashtra to that of other select states.

The second chapter, '***Socio-economic Inequities in Maharashtra: An update***' explores inequities in the state of Maharashtra across regions as well as sub-groups of population in the indicators of income, poverty and educational attainment among others. The chapter gives comparison of socioeconomic indicators of Maharashtra with other states such as Kerala, Tamilnadu, Bihar and Orissa. The chapter discusses rural-urban differences in poverty and the inequalities therein. An analysis of agrarian crisis in Maharashtra is also one of the important sections of this chapter.

The subsequent chapter is on '***Calorie Deprivation in Maharashtra: Analysis of NSS Data'***. This paper explores calorie deprivation in Maharashtra across regions as well as sub-groups of population such as caste, size-class of land possessed, religion, and household type (indicating principal occupation of the household) for rural and urban areas separately. There are two aspects to the discussion. First, the inequities are explored with regard to average intake in terms of calorie, fat, protein and cereals. Second, incidence, depth and severity of calorie deficiency are analysed.

The next three chapters of the report, viz. ***Implementation of TPDS and Antyodaya in Maharashtra, Implementation of ICDS in Maharashtra and Implementation of Mid Day Meal Scheme in Maharashtra,*** are the evaluations of these key schemes being implemented in Maharashtra. The schemes like ICDS and Mid day Meal are aimed at providing supplementary nutrition to the nutritionally vulnerable groups such as children, pregnant and lactating women and adolescent girls, whereas the schemes like Targeted Public Distribution System and Antyodaya are supposed to address the food security issues of the Below Poverty Line population. These three chapters give details of the implementation of these schemes such as coverage, utilisation of the scheme etc.

The chapter on, '***Undernutrition, Ill-health and the Role of the Health System'*** examines the role of health care in preventing undernutrition by effective community based management of infections as well as detecting undernutrition. This chapter analyses the vicious cycle of 'Infections and undernutrition' and demonstrates how these two are reinforcing each other. The chapter begins by outlining the burden of morbidity and mortality linked to undernutrition, primarily in the context of maternal and child health. It then accounts for mechanisms by way of which the vicious cycle of undernutrition perpetuates itself. Applying calculations of maternal and child morbidity and mortality to the state of Maharashtra, an attempt is made to calculate the number of child deaths, apparently due to infections but which can be attributed to undernutrition. These are avoidable deaths and healthy years of life lost. They can also be termed as 'excess' deaths, due to malnutrition. It then moves on to outline measures which need to be undertaken to break this vicious cycle.

Overall, this report is an attempt to describe the multifaceted nature of the problem of malnutrition and analyse the schemes implemented by the Government to overcome this problem in the state of Maharashtra.

A report by SATHI
For Maharashtra Health Equity and Rights Watch
A report by SATHI